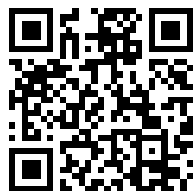

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MEDITERRANEAN PILOT
VOL. III

COMPRISING
THE WESTERN COAST OF GREECE,
INCLUDING THE GULFS OF PATRAS
AND CORINTH, THE IONIAN ISLANDS,
THE COAST OF ALBANIA AND THE
ADRIATIC SEA

SEVENTH EDITION
1946

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the port and of allotting positions in which they shall anchor. If Government vessels, or vessels belonging to the local port authority, are found patrolling in the offing, merchant vessels are advised to communicate with such vessels with a view to obtaining information as to the course on which they should approach the port. Such communication will not be necessary in cases where the pilot on board has already received this information from the local authorities.

(6) As the institution of the Examination Service will probably be unknown to vessels desiring to enter the port, especial care should be taken in approaching the ports, by day or night, to keep a sharp lookout for any vessel carrying the flags or lights mentioned in paragraph (7), and to be ready to "bring to" at once when hailed by her or warned by the firing of a gun or sound rocket.

In approaching by night any port in the British Empire, serious delay and risk will be avoided if four efficient all round lanterns, two *red* and two *white*, are kept available for use.

(7) By day the distinguishing flag of the Examination vessel will be a special flag (white and red horizontal surrounded by a blue border).

Also, three *red* balls vertically disposed if entrance is prohibited.

Usually the Examination vessel will fly the blue ensign, but in certain circumstances she may fly the white ensign.

By night the steamer will carry: (a) Three *red* lights vertically disposed if entrance is prohibited; (b) three *white* lights vertically disposed if entrance is permitted.

The above lights will be carried in addition to the ordinary navigation lights, and will show an unbroken light around the horizon.

(8) Merchant vessels approaching a British port, at which the Examination Service is in force, must hoist their signal letters on arriving within visual signalling distance of the port and are not to wait for the signal "What is the name of your vessel?" to be made from the Examination vessel.

(9) Masters are warned that, before attempting to enter any port when the Examination Service is in force, they must in their own interests strictly obey all instructions given to them by the Examination vessel.

Whilst at anchor in the Examination Anchorage, Masters are warned that it is forbidden, except for the purposes of avoiding accident, to do any of the following things, without permission from the Examination Officer:—(a) To lower any boat; (b) to communicate with the shore or other ships; (c) to move the ship; (d) to work cables; (e) to allow any person or thing to leave the ship.

(10) In case of fog, Masters of vessels are enjoined to use the utmost care, and the port should be approached with caution.

(11) When the Examination Service is in force, merchant vessels when approaching ports are especially cautioned against making use of private signals of any description, either by day or night; the use of them will render a vessel liable to be fired on.

(12) The pilots attached to the ports will be acquainted with the regulations to be followed.

THE LIBRARY



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FISH PORTS.
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**NOTATIONS OF SUPPLEMENTS AND ANNUAL
SUMMARIES OF NOTICES TO MARINERS
RELATING TO THIS BOOK.**

To be filled in by Navigating Officer.

(In Chart Depôts the first two columns are alone to be filled up.)

Title.	Date of Publication and Number.	Whether pasted in or noted in Margins of Book, and Date of each Correction.

CAUTION.

**Attention is called to British Admiralty Notices to Mariners
Nos. 1, 4 and 7, which are published annually.**

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NOTICE.

This volume should not be used without reference to the latest Supplement and Annual Summary of Notices to Mariners affecting it which may have been published.

A Supplement to this volume will generally be published annually until the latter is again taken up for revision.

After the publication of Supplement No. 1, each succeeding supplement cancels the former.

Between the time of the volume being taken up for revision and the publication of the new edition no supplement will be issued, but early in each year a Summary of the Admiralty Notices to Mariners affecting the volume, which have been published during the preceding year, will be issued as a separate publication.

The publication of all Supplements and Summaries of Notices to Mariners is announced in Admiralty Notices to Mariners.

The latest Supplement and any Annual Summary of Notices to Mariners that has been published affecting this volume will be obtainable gratuitously by purchasers of this volume from the Agents for the sale of Admiralty charts and other Hydrographic publications, on application either personally or by letter; in the latter case the cost of postage must be enclosed. For a list of these Agents *see* Admiralty Notice to Mariners No. 2, published annually.

THE
MEDITERRANEAN
PILOT, VOL. III

COMPRISING
THE WESTERN COAST OF GREECE,
INCLUDING THE GULFS OF PATRAS
AND CORINTH, THE IONIAN ISLANDS,
THE COAST OF ALBANIA AND THE
ADRIATIC SEA

SEVENTH EDITION, 1946

ALL BEARINGS ARE TRUE

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1946

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To face page ii.]

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v. 3

CAUTION.

IN THIS WORK THE BEARINGS ARE ALL TRUE, AND
WHEN GIVEN IN DEGREES ARE RECKONED
CLOCKWISE, FROM 000° (NORTH) TO 359°.

THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.

THE LATITUDES AND LONGITUDES GIVEN IN THE
TEXT ARE APPROXIMATE.

THE DISTANCES ARE EXPRESSED IN NAUTICAL MILES
OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO
THE TENTH PART OF A NAUTICAL MILE.

THE DEPTHS ARE GIVEN BELOW CHART DATUM LEVEL
WHERE NOT OTHERWISE STATED.

HEIGHTS ON THE LAND ARE GIVEN ABOVE MEAN
LEVEL OF HIGH WATER SPRING TIDES.

FIGURES IN BRACKETS GIVEN AFTER THOSE
DENOTING FEET, FATHOMS AND YARDS ARE
THEIR EQUIVALENTS IN METRES.

TIME IS EXPRESSED IN THE FOUR-FIGURE NOTATION
COMMENCING AT MIDNIGHT.

THE TERM "STEAM VESSEL" USED HEREIN IN-
CLUDES ANY VESSEL PROPELLED BY MACHINERY.

A NAME IN BRACKETS, IMMEDIATELY FOLLOWING
ANOTHER NAME, IS THE OBSOLETE NAME WHICH IS
STILL SHOWN ON THE ADMIRALTY CHARTS. AS A
GENERAL RULE, THE BRACKETED NAME IS ONLY
INSERTED IN THE DESCRIPTION OF THE PLACE OR
OBJECT PREVIOUSLY BEARING THAT NAME.

WHEN SHADING IS USED TO INDICATE COLOURS OF
FLAGS, TIDAL LIGHT SIGNALS, OR
BEACONS, IT IS AS FOLLOWS:



Yellow.



Red.



Blue.



Green.



Black.

ADVERTISEMENT TO SEVENTH EDITION

The Mediterranean Pilot, Vol. III, contains sailing directions for the western coast of Greece, from Cape Matapan, including the Gulfs of Patras and Corinth, the Ionian islands, the coast of Albania and the Adriatic sea.

The present edition has been prepared by Captain C. M. Gibson, O.B.E., R.N., and contains all the information available to date of publication. The description of the coast of Greece eastward of Cape Matapan will be found in Mediterranean Pilot, Vol. IV.

The names of geographical features in Greek territory have been revised with the assistance of the Permanent Committee on Geographical Names; official names only, as a general rule, appear in the text. Names in brackets are those on the current Admiralty charts. A list of Greek names in local use, or alternative names for the same feature, is given in Appendix IV and should be consulted when conversing with natives or when otherwise necessary.

The Meteorological information has been revised by the Meteorological Office of the Air Ministry. Temperature is expressed in degrees Fahrenheit, rainfall in inches, speed in knots, and distance in nautical miles unless stated otherwise. Information received from meteorological services which do not use these units has been converted into the units mentioned above by the Meteorological Office.

Mariners and others are invited in the interests of navigation to forward to the Hydrographer of the Navy, Admiralty, London, S.W.1, any information that may come under their notice, which would be useful for the correction of the charts and other hydrographic publications issued by the British Admiralty; *early* advice as to newly-discovered dangers, the establishment of, or changes in, any aids to navigation or port facilities, is specially requested.

Copies of a form (H. 102), on which to render information, can be obtained *gratis* from the Hydrographer of the Navy, Admiralty, London, S.W.1, or from any of the agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners, No. 2.

By the publication of this volume, the sixth edition of the Mediterranean Pilot, Vol. III, 1929, and Supplement No. 8, 1939, are cancelled, and all information affecting that work contained in Notices to Mariners up to and including No. 2846, of 1946, has been embodied in this volume; for Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notices to Mariners, should be consulted.

A. G. N. WYATT,
Rear-Admiral and
Hydrographer of the Navy.

Hydrographic Department,
Admiralty, London,
10th August, 1946.

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GLOSSARIES

LIST OF FOREIGN TERMS OCCURRING IN
CHARTS AND SAILING DIRECTIONS

GREEK TERMS

GREEK	ENGLISH	GREEK	ENGLISH
Ákra . . .	Cape	Naváyion . . .	Wreck
Akrópolis . . .	Citadel	Né-os, a, on . . .	New
Áspr-os, i, o. . .	White	Nisí, nisia . . .	Island, islands
Ávlox . . .	Channel	Nisís, nisdhes . . .	Islet, islets
Áy-ios, ía, ion . . .	Saint, Holy	Nísos, nísoi . . .	Island, islands
(Agios, Agia is an obsolete form of this term)		Órmos . . .	Bay
		Óros . . .	Mountain
Dhiáporos . . .	Passage	Palai-ós, á, ón . . .	Old
Kástron . . .	Castle	Pélagos . . .	Open sea
Kávos . . .	Cape	Pérama . . .	Ferry
Kefála . . .	Head	Pétra . . .	Rock
Kólpos . . .	Gulf	Pírgos . . .	Tower
Korífi . . .	Summit	Póros . . .	Strait
Levk-ós, í, ón . . .	White	Potamós. . .	River
		Potúnda . . .	Point
Limín . . .	Harbour	Skála . . .	Landing-stage, quay
Límni . . .	Lake, marsh	Stíli . . .	Post; beacon
Mávr-os, i, o . . .	Black	Vounó . . .	Hill, mountain
Megál-os, i, o . . .	Big, great	Vrákhos, vrákhoi	Rock, rocks
Még-as, áli, a . . .	Big, great	Xéra . . .	Reef
Mikr-ós, á, í, ó, ón	Small		

NOTES ON THE PRONUNCIATION OF TRANSLITERATED GREEK NAMES
AND TERMS

An acute accent indicates the syllable to be stressed. A diaeresis over the second of two vowels close together indicates that both vowels are sounded, as in the English word "cooperate".

av before vowels and voiced consonants is pronounced "av"; before unvoiced consonants it is pronounced "af".

g before hard vowels and before all but palatal consonants is a guttural sound, absent from English, resembling French "r grassé" or Arabic *ṭ ghain*; in other cases it is pronounced like "g" in "go".

dh is pronounced like "th" in "the"

ev is pronounced according to the rules given for "av"

th	is pronounced like "th" in "thick"
oi	is pronounced like "i" in "hit" or "machine"
ou	is pronounced like "oo" in "food"
s	before vowels and unvoiced consonants is pronounced like "ss" in "hiss"; before voiced consonants, it is soft like "z"
tz	is pronounced "dz"
ch	is pronounced like "ch" in "church"
kh	is a sound absent from English. Before soft vowels it is pronounced like "ch" in the German word "dich", and before hard vowels like "ch" in the German word "doch"

ALBANIAN TERMS

ALBANIAN	ENGLISH	ALBANIAN	ENGLISH
Gji, -u . . .	Bay	Pellg, -u . . .	River-swamp, bight
Gur, -i . . .	Stone, rock		
Kep, -i . . .	Cape	Rrug-ë, a . . .	Road, street
Liçen, -i . . .	Lake	Shën . . .	Saint
Maj-ë, a . . .	Peak, summit	Shkamb, -i . . .	Cliff, crag, rock
Mal, -i . . .	Mountain (mass or range)	Varr, -i . . .	Tomb

NOTE ON THE PRONUNCIATION OF THE THIRTY-SIX LETTERS AND DIGRAPHS IN THE ALBANIAN ALPHABET

ALBANIAN	R.G.S. II TRANSLITERATION	PRONOUNCED
a, e, i, o, u	same	as in Italian
b, d, f, h, k, m, n,		
p, s, t, v, z, sh	same	as in English
c	ts	as in <i>rats</i>
ç	ch	as in <i>church</i>
ë	e	like French "e" in <i>table</i>
g	g	as in <i>got</i>
j	y	as in <i>yet</i>
l	l	as in <i>leave</i>
q	ky	like "k" in <i>Kew</i>
r	r	weakly
x	dz	as in <i>adze</i>
y	ü	like German "ü", French "u"
dh	dh	like "th" in <i>this</i>
gj	gy	like "g" in <i>ague</i>
ll	l	as in <i>wall</i>
nj	ny	like "ni" in <i>pinion</i>
rr	r	strongly as in <i>carrot</i>
th	th	as in <i>thistle</i>
xh	j	as in <i>joy</i>
zh	zh	like "s" in <i>pleasure</i>

YUGOSLAV TERMS

YUGOSLAV	ENGLISH
Bakar . . .	Copper
Banak . . .	Bank, shoal
Banja . . .	Spa
Be-o (<i>or</i> -li), la, lo. . .	White
Bijel(i), -a, o .	White
Bilo. . .	Ridge, crest
Boka . . .	Mouth, gulf
Brdo . . .	Mountain
Crn(i), -a, o .	Black
Crven(i), -a, o .	Red
Debe-o (<i>or</i> li), la, lo . . .	Thick, broad
Donj-i, a, e .	Lower
Draga . . .	Valley, bay, cove
Dražica . . .	Cove
Dubok(i), -a, o	Deep
Gat . . .	Weir, lock, sluice, dam
Glavica. . .	Peak with deep sides
Gornj-i, a, e .	Upper
Gospa . . .	Our Lady
Grad . . .	Town, fortress, castle
Gradina . . .	Garden, enclo- sure; ruins
Greben . . .	Cliff, crest, rock
Guri . . .	Stone, rock
Hrastovac . . .	Oak forest
Hrid, -i. . .	Rock, -s above- water
Hum . . .	Hillock, mound
Izvor . . .	Spring, source
Jezero . . .	Lake
Jug . . .	South
Južn-i, a, o .	Southern
Kamen . . .	Stone
Kanal . . .	Canal, channel
Luka . . .	Port, bay
Mal-i, a, o . .	Small
More . . .	Sea
Nov(i), -a, o .	New
Obala . . .	Coast, bank, quay

YUGOSLAV	ENGLISH
Otočić . . .	Islet
Otok . . .	Island
Plićak, Plićina.	Shoal, shallow
Pod . . .	Beneath; floor, ground
Poljana . . .	Field, plain
Polje . . .	Field
Poluotok . . .	Peninsula
Potok . . .	Brook, stream
Pristanište . .	Harbour, land- ing-place
Prolaz . . .	Passage
Rat . . .	Cape
Rečina . . .	Large dry river- bed
Reka, or Rijeka	River
Rt . . .	Cape, point, spur
Sidrište . . .	Anchorage
Školj . . .	Island, reef
Stanica . . .	Stopping place, station
Star(i), -a, o .	Old
Stena . . .	Cliff, rock, quartz
Svet(i), -a, o .	Holy, Saint
Tank-i, a, o . .	Slender, thin
Tesnac . . .	Strait, gorge, defile
Ulaz . . .	Entrance
Uvala, uvalica	Bay
Vel-a, i, o . .	Large, great
Velik-i, a, o .	Large, great
Vrata . . .	Door, gate
Vrh . . .	Peak, top
Zaliv . . .	Bay, gulf
Zaton . . .	Gulf
Ždrelo . . .	Pass, defile, en- trance to a ravine
Železnica . . .	Railway
Železnička stan- ica . . .	Railway-station
Željeznica . . .	Railway
Željeznička postaja . . .	Railway-station

NOTE ON THE PRONUNCIATION OF THE THIRTY LETTERS AND DIGRAPHS
IN THE YUGOSLAV ALPHABET

YUGOSLAV	R.G.S. II TRANS- LITERATION	PRONOUNCED	REMARKS
A, a	a	like a in <i>father</i>	
B, b	b		
V, v	v		Sometimes pronounced like a short "u", e.g. Vrh, pronounced Urkh; or Triglav, pronounced Triglau
G, g	g	like "g" in <i>get</i>	
D, d	d		
Đ, đ	dy (d' when final)	like "dge" in <i>edge</i>	
E, e	e	like "e" in <i>bed</i>	
Ž, ž	zh	like "s" in <i>pleasure</i>	
Z, z	z		
I, i	i	like "i" in <i>machine</i>	
J, j	y	like "y" in <i>yes</i>	
K, k	k		
L, l	l		After a vowel, sometimes pronounced like a short "u"
Lj, lj	ly (l' when final)	like "lli" in <i>million</i>	
M, m	m		
N, n	n		
Nj, nj	ny (n' when final)	like "ny" in <i>canyon</i>	
O, o	o	like "au" in <i>ought</i>	
P, p	p		
R, r	r		A semi-vowel: rolled as Scots "r" in <i>burn</i>
S, s	s	like "s" in <i>yes</i>	
T, t	t		
Ć, ć	ty (t' when final)	like "tch" in <i>catch</i>	
U, u	u	like "oo" in <i>brood</i>	
F, f	f		
H, h	kh (h before vowels)	like Scots "ch" in <i>loch</i>	
C, c	ts	like "ts" in <i>hats</i>	
Č, č	ch	like "ch" in <i>church</i>	
Dž, dž	j	like "j" in <i>jug</i>	
Š, š	sh	like "sh" in <i>shall</i>	

ITALIAN TERMS

ITALIAN	ENGLISH	ITALIAN	ENGLISH
Avamporto .	Outer harbour	Banco . .	Sandbank
Bacino . .	Basin, dock	Bianco, a .	White
Baia . . .	Bay	Bianch-i, u .	White
Banchina .	Quay, wharf, embankment	Bocca :	
		bocche .	Mouth, estuary
		Borgo . .	Suburb

ITALIAN	ENGLISH
Braccio . . .	Arm
Busa <i>or</i> Buso	Inlet
Cala . . .	Inlet, creek, cove
Canale . . .	Canal, channel
Canali . . .	Canals, channels
Cantiere . . .	Shipyards
Capo . . .	Cape, headland
Casa . . .	House
Case . . .	Houses
Casino . . .	Small house
Castel <i>or</i> Castello . . .	Castle, keep
Città . . .	City, town
Colle . . .	Rising ground, hill
Costa . . .	Sea coast
Coste . . .	Sea-coasts
Darsena . . .	Dockyard, wet dock
Diga . . .	Dike, breakwater, sea-wall
Due . . .	Two
Faro . . .	Lighthouse
Fari . . .	Lighthouses
Fiume . . .	River
Fiumi . . .	Rivers
Foce . . .	Mouth of a river
Fonda . . .	Depth; anchorage
Fossa . . .	Pit, ditch; water- course
Golfo . . .	Gulf
Insenatura	Inlet, creek
Isola . . .	Island
Isole . . .	Islands
Isolotto . . .	Islet
Isolotti . . .	Islets
Lago . . .	Lake
Laghi . . .	Lakes
Laguna . . .	Lagoon
Litorale . . .	Coast, shore
Marina . . .	Beach; port of an inland village
Masseria . . .	Tenancy including a number of farms
Montagna . . .	Mountain
Monte . . .	Mountain, hill
Monti . . .	Mountains, hills

ITALIAN	ENGLISH
Naviglio . . .	Navigable canal, ship channel
Nov-o, a . . .	New
Nuov-o, a : -i, e . . .	New
Passagio . . .	Passage, crossing
Penisola . . .	Peninsula
Piazza . . .	Public square
Pineta . . .	Pine grove
Poggio . . .	Height, hill
Ponente . . .	West, West wind
Ponte . . .	Bridge
Pontile . . .	Jetty
Porticciolo . . .	Small harbour
Porto . . .	Port, harbour
Promontorio	Promontory
Punta . . .	Point, headland
Rio . . .	Stream
Riva . . .	Bank, shore
Rocca . . .	Rock, crag, tower, keep
Rocche . . .	Rocks
Sacca . . .	Enclosed bay
San <i>or</i> Santo, Santa . . .	Saint, Holy
Santuario . . .	Sanctuary, shrine
Sasso . . .	Stone, crag
Scogliera . . .	Reef of rocks awash, break- water
Scoglio . . .	Reef, rock
Scogli . . .	Reefs, rocks
Secca . . .	Sandbank, shoal
Secche . . .	Shoals
Seno . . .	Small bay, cove
Sud . . .	South
Testa . . .	Head, bluff
Toppa . . .	Height, hill
Torre . . .	Tower
Torri . . .	Towers
Torrente . . .	Mountain torrent
Tramontana	North, North wind
Valle, val . . .	Valley
Vallone . . .	Large valley
Vecch-io, ia : -i, ie . . .	Old

SYSTEM OF ORTHOGRAPHY.

The following rules for the spelling of geographical names (termed the R.G.S. II system) have been adopted for British official use, and the names in Admiralty Hydrographic publications will be rendered in accordance with these rules as opportunity occurs.

In new editions of the various volumes of sailing directions names are, generally speaking, given in accordance with these rules, but where the name on the chart shows an older rendering of a name, such chart name is given in brackets after the new rendering and will also be given in the Index.

The rules for spelling in the R.G.S. II system are as follows :—

- (1) The spelling of every place-name in an independent country or self-governing dominion using the Roman alphabet (including "Roman" alphabets containing extra or modified letters, such as Czech, Serb-Croat, Polish, Romanian, etc.) shall be that adopted by the country or dominion.
- (2) In colonial possessions the spelling of such place-names as belong to languages coming under Rule (1) will be spelt in accordance with that rule.
- (3) The accents and diacritical marks in official use by the above countries will be retained. Wherever it appears desirable, the pronunciation will be shown by giving the name as transliterated on the system below.
- (4) All other place-names throughout the world will be spelled in general accordance with the following system.

The broad features of this system are—

- (a) That vowels are pronounced as in Italian and consonants as in English :
- (b) That every letter is pronounced, and no redundant letters are used.

This system aims at giving a close approximation to the *local* pronunciation ; but it is recognised that in some languages, notably Russian, Greek, and Arabic, the necessity for letter-for-letter transliteration often renders this impossible.

TABLE OF SPELLING AND PRONUNCIATION R.G.S. II.

a	The long and short Italian vowels, as in <i>lāda</i> ..	Somāli; Rāvennā.*
ā	Between <i>a</i> in <i>fat</i> and <i>e</i> in <i>eh</i> ? ; chiefly in Teutonic and Finno-Ugrian languages	Māhring; Pärnu.
ai	The two Italian vowels, frequently diphthongal, almost as in <i>aisle</i> ; but pronounced <i>ei</i> and <i>ī</i> in Greek names	Wadai; Shanghai.
au	The two Italian vowels; frequently diphthongal; almost as <i>ou</i> in <i>out</i>	Sakan; Bauchi.
aw	When followed by a consonant, or when terminal, as in <i>awt</i> , <i>law</i>	Dawna; Saginaw.
b	As in English.	
c	Not to be used, but always replaced by <i>h</i> or <i>s</i> ; except in the compound <i>ch</i> , and in many conventionally-spelt words, as	Kandahar; Serang. Calcutta; Celébes.
ch	As in <i>church</i> ; never <i>tch</i> or <i>tsch</i> for this sound ..	Chad; Kerch.
d†	As in English.	
dh	Soft <i>th</i> as in <i>they</i> ; a slight <i>d</i> sound sometimes preceding it in Semitic languages	Hadhramaut; Riyadh.
e	Long as in <i>eh</i> ? short as in <i>bet</i> . (For the <i>e</i> sound in the French <i>je</i> , see note at end on the "neutral vowel.")	Gālo; Maŕking.*
(ee)	Used for <i>i</i> (<i>q.v.</i>) only in a few conventional names	Darjeeling; Keelung.
ei	The two Italian vowels, frequently diphthongal as in <i>rein</i> , but pronounced <i>i</i> in Greek names ..	Beirut; Raheita.
(eu)	Not used as a single sound.	
f	As in English; <i>ph</i> must not be used for this sound	Mustafa; Maidan-i-Naftun.
g	Hard, as in <i>get</i> , <i>gift</i> : never as in <i>gem</i> , <i>gin</i> ..	Gedāref; Gilgit.
gh	Soft guttural, the Arabic <i>ghain</i>	Ghadames; Baghdad.
h	Used only when sounded; or in the compounds <i>ch</i> , <i>dh</i> , <i>gh</i> , <i>hh</i> , <i>sh</i> , <i>th</i> , <i>zh</i>	Ahmadabad; Abdullah.
i	Long as in <i>marine</i> ; short as in <i>piano</i>	Fiji; Kibonde.
j	As in English; except in transcription of Chinese, where it equals <i>sh</i> , or the French <i>j</i>	Juba, Ujiji (Eng. <i>j</i>); but Jaoping (Fr. <i>j</i>).
k	As in English; hard <i>c</i> should never be used (except in conventionally-spelt words)—thus, not Corea, Cabul, but	Korea; Kabul.
kh	Hard aspirated guttural, as in the Scottish <i>loch</i> (not as in <i>loch</i>)	Khan; Sebkhā.
l† m† n†	} As in English.	

*The long and short symbols given here are merely for explanation, not for use.

†See note at end on *Liquid Sounds*.

- ng** Has three separate sounds, as in *vanguard*, *finger*, and *singer*. If necessary to distinguish, a hyphen may be placed, as in *van-guard*, *singer*... .. In-galla; Bongo; Ng-ami; Tong-a.
- ngg** May be used for the sound of *ng* as in *finger* Trengganu; Yanggang-a.
- o** Long as in *both*¶: short as in *rotund* Kigōma; Hōnōlulu.*
- ō** As in German; equals the French *ou* in *peu*; or nearly the English sound in *fur* Barkōl.
- (oo)** Used for *u* (*q.v.*) only in a few conventional names, chiefly Indian and Chinese Poona; Foochow.
- oi** The two Italian vowels; frequently diphthongal as in *oil*, but pronounced like *i* in *fit* in Greek names Hanoi.
- öi** The diphthong as in French *oeil* and Norwegian *høi* Hōiland.
- ou** Dissyllabic, and not as French or English *ou*, except in Greek names where it has the French value Zlatoust; Yaroua.
- ow** Used as a diphthongal combination of *ō* and *w* only in the romanisation of Chinese Hankow.
- p** As in English.
- ph** As in *loophole*; not to be used for the *f*-sound, except conventionally Chemulpho; Haiphong.
- q** Represents *only* the Arabic *qaf* and the Hebrew *qof*; i.e. a guttural *k* (as a rule) Qena; Qiryath.
- qu** Should never be employed to represent the sound of *kw*; thus, not Namaqua, Quorra, but Namakwa; Kworra.
- r** As in English; should be distinctly pronounced.
- s†** As English *ss* in *boss*, not as in *these* or *pleasure* Burgos; Masikesi.
- sch** As in *discharge* Peachanka.
- sh** } As in English.
tt }
- th** Hard *th* as in *thick*, not as in *this* (except conventionally in Fijian) 'Athlith; Thingvellir.
- u** Long as in *rude*, or as *oo* in *boot*; short as in *pull* Zulu; Rūanda.*
- ü** As in German: equals the French *u*, as in *tu* (Fr.) Üsküdar.
- v** } As in English.
w }
x }
- y** Always a consonant, as in *yard*; it should not be used as a terminal vowel, *e* or *i* being substituted; e.g. not Kwaly or Wady, but Kikuyu; Maya. Kwale; Wadi.
- z** As in *gaze*, not as in *asure*.
- zh** As the *z* in *treasure*, the *s* in *asure*, or the French *j* in *je*; but for the sound in Chinese use *j* (*vide* note about under *j*) Zhob.

*The long and short symbols given here are merely for explanation, not for use.

†See note at end on *Liquid sounds*.

¶The true Italian *ō* is broader than this; almost as in *broth* (= R.G.S. II *aw*). The letter *o* is conventionally used for this sound in certain names in Nigeria, Tonga, etc.: e.g. Oyo, Fofoa.

NOTES.

The doubling of a vowel or a consonant is only necessary when there is a distinct repetition of the single sound, and should otherwise be avoided

Nuusafee; Moorea;
Jidda; Muhammad.

Accents should not generally be employed; but in order to indicate or emphasize the stress, an acute accent may be used

Sarāwak; Qāntara;
Tong-atābu; Parānā.

A long or short mark over a vowel (e.g. ā, ò) should only be used (and that sparingly) when without it there would be danger of mispronunciation ..

Kūt; Kyōto; Abōeo.

Hyphens will not be used except to indicate pronunciation and with the particle *-i-* (in Persian, Fijian, etc.)

Ta-if; Pusht-i-Kuh;
Nuku-i-Ra.

Inverted comma and apostrophe.—The inverted comma ' is employed only to represent the Arabic *'ain*, the Maltese *'ghain*, and the Hebrew *'eyin*. The apostrophe ' in foreign words indicates a liquid sound (*see* below).

Liquid sounds.—The occasional "liquid" or "palatalised" sound of *d, l, n, s, t*, etc. (as in *d'you, lure, new, pursue, tune*, etc.) is as a rule sufficiently represented by a following *y*; where, however, owing to a following consonant, or to the palatalised letter coming at the end of a word, the *y* is inapplicable, the liquid sound will be represented by an apostrophe, thus: *d', l', n', s', t'*, etc.

The "Neutral vowel."—The "indeterminate" or "neutral" vowel sound (*er*), i.e. the sound of *a* in *marine*, *e* in *often*, *i* in *stir*, *io* in *nation*, *o* in *connect*, *ou* in *curious*, *u* in *difficult*, etc., *e* in French *je*, or the often unwritten vowel (*Fai-ha*) in Arabic, etc., is represented as a rule by *a*: as in Basra, Hawiya; but sometimes by *e*, when the sound approximates more to *e* than to *a*; as Meshed, El Gezira.

(In any guide to pronunciation issued by the Permanent Committee on Geographical Names, the "neutral vowel" is represented generally by the italic *e*: occasionally also by italic *a* or *u*.)

This sound must not be confused with *e-mute*, where the *e* is not sounded at all: as in Abbeville.

Nasal vowels.—In illustrating the pronunciation of French, Portuguese, Polish, etc., nasal vowels, the nasalisation will be represented by italic *u*; as Czestochowa pr. Chāstokhóva.

Note.—The Royal Geographical Society has published a book entitled "Alphabets of Foreign Languages transcribed into English according to the R.G.S. II system." This book enables the correct rendering of names to be obtained, also of names in languages which are transliterated letter for letter.

INFORMATION RELATING TO ADMIRALTY CHARTS AND PUBLICATIONS, AND GENERAL NAVIGATION.

ON THE CORRECTION OF ADMIRALTY CHARTS.

Guides to Navigation.—In addition to the charts, the navigational publications which are primarily affected by the continual changes and alterations that take place are the Admiralty Sailing Directions, the Admiralty List of Lights, Fog Signals and Visual Time Signals, and the Admiralty List of Radio Signals. The Admiralty Notices to Mariners contain information mainly for the correction of the charts and navigational publications. 5

CHARTS.

1. Degree of Reliance.—While the Admiralty charts can be relied upon to be correct for all information received, it should be clearly understood that the value of a chart depends on the character of the original survey and on the completeness of the reports of subsequent changes. The remarks on "The Use of Charts as Navigational Aids, &c.", which are subjoined should be carefully studied in this connection. 10 15

2. System of Dating and Issue of Corrected Copies.—Admiralty charts after first publication, are kept corrected by means of new editions, large corrections, and small corrections. Copies of charts issued by the Hydrographic Supplies Establishment, Admiralty Chart Agents or Admiralty Chart Dépôts are corrected, except from temporary and preliminary Notices to Mariners, for all navigational information to the date of issue. 20

New charts.—The date of publication of a chart is shown outside the bottom margin, in the middle, e.g. :— 25

Published at the Admiralty 30th May, 1938.

New Editions.—When a chart is revised throughout and modernised in style a new edition is published, the date being shown outside the bottom margin and to the right of the date of publication, e.g. :—

New Edition 2nd Jany., 1938. 30

All large and small corrections notations are at the same time erased, and all old copies of the charts are cancelled.

Large Corrections.—When a chart is corrected from important information which is too comprehensive to promulgate by Admiralty Notice to Mariners or to insert conveniently by hand on existing copies, but when the chart is not revised throughout, the date on which these corrections are made is shown on the chart outside the bottom margin and to the right of the date of publication, and in the case of a chart already marked with a new edition date, below such date, e.g. :— 35 40

Large corrections 10th Feb., 1938.

All small corrections notations are at the same time erased, and all copies of the chart are cancelled.

Small Corrections.—

- (i) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g. :—

Small corrections 1938-903.

- Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are corrected by hand from such information.

- (ii) When a chart is corrected from information which is considered of no importance from the standpoint of safe navigation, and which is, therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction are entered on the chart, in one of two ways, in the bottom left-hand corner below the margin and in sequence with the notations referred to in the preceding paragraph, e.g. :

*Small corrections, 1938—*5.20*—*

or Small corrections 1938—(VI.25)

- These indicate that the chart received minor corrections on the 20th May or 25th June, respectively.

- In such cases copies of the chart held by ships and establishments are not usually replaced by new copies, but in exceptional cases, e.g., when new compasses are inserted, new copies of the charts may be supplied. It should, however, be particularly noted that the absence of corrections represented by square or bracket dates from a chart does not invalidate it for navigation.

- 3. Correction of Charts in Ships.**—All small but important corrections affecting navigation that can be made to the charts by hand are promulgated in Admiralty Notices to Mariners and, with the exception of corrections from temporary or preliminary Notices, should at once be neatly made in waterproof violet ink on the charts affected, the year (if not already shown) and numbers of the notices being inserted, also in waterproof violet ink, in the bottom left-hand corner of the chart. The recognised abbreviations shown on Admiralty chart No. 5011 ("Signs and abbreviations used on Admiralty Charts") should be used.

Generally speaking, the amount of information which should be inserted on a chart should be in accordance with that already shown.

- On large scale charts*, the abridged descriptions, as shown on chart No. 5011, of all details of all lights, light-buoys and fog signals, and the year dates of obstructions, reported shoals, dredged channels, depth on bars or in shifting channels, and irregularities of lights, should be inserted.
- On coastal charts*, the abridged descriptions of only the principal lights and fog-signals, i.e., those to assist in approaching or making the land, should be inserted.

Particulars of such lights should be omitted, in the following order, as the scale of the chart decreases, viz. :—

- (i) Elevation, (ii) Period, (iii), Number in Group, and (iv) Visibility.

Particulars of fog signals should be inserted in their appropriate positions if space permits, but should otherwise be entered in a tabulated list under the title or some other convenient place on the chart.

Inner harbour light-buoys and beacons should not be inserted on coastal charts, and against other light-buoys only the character of the light should be inserted.

On ocean charts, lights which are visible 15 miles or over should alone be inserted and then only their character and colour.

On all charts, writing should be inserted as much as possible clear of the water, unless the relative objects are on the water and care should be taken not to obliterate any information already on the chart. When cautionary or tidal notes, &c., are inserted, they should be written in a convenient but *conspicuous* place, preferably near the title, where they will not interfere with other details.

Erasures should never be made but the details should, when necessary, be crossed through in waterproof violet ink.

Admiralty Notices to Mariners are occasionally accompanied by reproductions of portions of charts (known as "blocks"), and when correcting charts from such blocks the following points should be borne in mind :—

- (i) A block may not only indicate the insertion of new information, *but also the omission of matter previously shown*. The latter would, however, invariably be mentioned in the text of the Notice, and the fact that a block accompanies a Notice should not cause the text of the Notice to be disregarded.
- (ii) The limiting lines of a block are determined for convenience of reproduction and need not be adhered to when cutting out for pasting on the chart, provided that the point mentioned in the preceding paragraph is taken into consideration.
- (iii) The new information shown on a block can sometimes be inserted on the chart by hand, the reason for issuing a block in such a case being to avoid a long description of the new information in the text of the Notice.
- (iv) Owing to distortion the blocks do not always fit the charts exactly, care should therefore be taken when pasting a block on to a chart that the more important navigational corrections fit as closely as possible. This can best be assured by fitting the block while it is dry and making two or three pencil ticks round the edges for use as fitting marks after the paste is applied.

Corrections from Temporary or Preliminary Notices to Mariners should be inserted on the charts *in pencil* and the year and number of the notice should be shown against them, e.g. :—N.M. $\frac{742}{1838}$ temp. and also in the bottom left-hand corner of the chart, in pencil, *below* the small corrections notations (*see above*). Temporary corrections should be rubbed out when the notice is received cancelling them, but preliminary corrections should be inked in when the notice is received reporting that the changes have been made.

Charts stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are *not* corrected from Temporary or Preliminary Notices to Mariners, and when charts are received from one of these sources they should be
 5 corrected in pencil as necessary from the copies of such Notices already held, or from those supplied with the charts.

Corrections from Radio Navigational Warnings concerning derelicts and drifting obstructions, the temporary extinction of lights, displacement of important aids to navigation, ice reports &c., should
 10 also be noted *in pencil*, as received, on the charts affected. Radio Navigational Warnings of a permanent nature and those relating to derelicts and drifting obstructions dangerous to navigation are re-issued in the form of Admiralty Notices to Mariners, but other warnings are not re-issued in this way, except in special circumstances.

15 Corrections from information received from authorities other than the Admiralty should be noted, *in pencil*, on the charts affected, but no charted danger is to be expunged without the authority of the Hydrographer of the Navy.

NAVIGATIONAL PUBLICATIONS.

20 Admiralty Sailing Directions, Supplements, &c.

1. The Admiralty Sailing Directions, consisting of about 70 volumes for the whole world, contain general information useful to the navigator.

An index chart bound near the beginning of each volume shows the area dealt with and the serial numbers and limits of all Admiralty
 25 charts for the area which were published *when the volume was printed*.

Each volume is periodically revised throughout, and, in the intervals between the publication of new editions, Admiralty Notices to Mariners and Supplements are published to enable the volume to be corrected. It should, however, be clearly understood that Sailing Directions cannot
 30 be correct in all minor details after the date of the latest Supplement.

The above-mentioned corrections are not made in the Sailing Directions stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts.

A new edition of each volume of Sailing Directions is published at
 35 intervals of approximately from ten to twelve years. The number of the latest Admiralty Notice to Mariners used in its compilation is given in the "Advertisement" on page iii of each volume, and the numbers of the Notices affecting it between the dates of going to press and issue to ships and establishments are given in the Notice
 40 announcing its publication, to enable the new edition to be corrected before being brought into use.

A Supplement to each volume is generally published annually, each succeeding Supplement cancelling the former. When a volume is taken up for revision, however, no further Supplement to that edition
 45 is issued, but subsequent Notices to Mariners affecting it are summarised each year and issued as a separate publication, until the new edition of the volume is published.

A tabular form for notation of the existence of Supplements and Summaries of Notices is printed on the front fly-leaf of all Sailing
 50 Directions, and these notations are made as necessary in all copies issued by the Hydrographic Supplies Establishment and the Admiralty Chart Depôts.

Supplements and Summaries of Admiralty Notices to Mariners

should be retained intact. *Whenever reference is made to the Sailing Directions, the Supplement must be consulted.* The existence of a Supplement or Summary of Admiralty Notices to Mariners is to be entered in the tabular form inside the cover of the Sailing Directions.

Admiralty Notices to Mariners affecting Sailing Directions *are not to be cut up and pasted in, but the book is to be annotated in the margin, or corrected in manuscript, as convenient.*

2. The Admiralty List of Lights, Fog Signals and Visual Time Signals.—The Admiralty List of Lights, Fog Signals and Visual Time Signals for the world is issued in twelve volumes divided geographically as shown on the index chart at the beginning of each volume.

Light-buoys are *not* included in the list.

The volumes are published annually at the rate of one volume per month commencing with Volume I in January and ending with Volume XII in December. Supplements to these volumes will not be issued.

Each volume will be issued with an inscription on its cover and title page stating the date to which the volume has been corrected which will be approximately six weeks prior to the date of its issue. Permanent and temporary corrections or additions to each volume which may occur between the date of correction and date of issue, will be promulgated by Section III of Admiralty Notices to Mariners.

AMENDMENTS

Important amendments are promulgated in Admiralty Notices to Mariners. In Section IIIA of each Weekly Complete Edition of these Notices will be found all additions and alterations made to Lights, Fog Signals and Visual Time Signals by the Notices issued during the week affected; certain other additions and alterations are also included in Section IIIA, which, though not of sufficient importance to necessitate the issue of a Notice to Mariners, will be found of use to the seaman. Section IIIB contains similar information but of a temporary character; Section IIIC also contains temporary information but consists of a list of lights and fog signals extinguished or inoperative on account of damage sustained during the war.

Corrections to the Light Lists should be made in pencil, or extracted from Section III and pasted in the appropriate volume.

NOTE: Corrections are not made in copies of the Lists of Lights, etc., stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depots, and copies received from these sources should accordingly be corrected from the weekly editions of the Notices to Mariners before being brought into use.

3. The Admiralty List of Radio Signals.—The Admiralty List of Radio Signals is issued in three volumes.

Volume I.—Communications—Comprises particulars of radiotelegraph coast stations, together with general regulations; it also includes such subsidiary services as medical advice supplied by radio, together with details of the organisation for transmitting British official messages to merchant ships.

Volume II.—Navigational Aids—Comprises particulars of services from direction-finding stations and radiobeacons, together with radio time signals and navigational warnings (with ice signals); all relevant codes and regulations will be found in this volume.

Volume III.—Meteorological Services—Comprises particulars of

weather services provided for the use of shipping, together with relevant codes and lists of meteorological observation stations. New editions of each volume will normally be published annually. A supplement to each volume is also issued.

- 6 These Supplements embody corrections subsequent to the date of going to press, and are issued gratis with each volume. All corrections later than those included in the Supplement are promulgated in Section IV of the complete weekly edition of Admiralty Notices to Mariners.
- 10 Copies of the List stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts are not kept corrected, and Lists received from these sources should accordingly be corrected from the Supplements and from the weekly editions of the Admiralty Notices to Mariners before being brought into use.
- 15 **4. The Admiralty Tide Tables.**—The Admiralty Tide Tables are published in three sections as follows:—
 For "HOME WATERS (British Isles, Europe and North coast of Africa)."
 For "Atlantic and Indian Oceans."
 20 For "Pacific Ocean and Adjacent Seas."
 Each section contains two parts, Part I giving tidal predictions for Standard Ports, and tidal stream predictions for certain straits and channels; Part II giving data for predicting tides at places which are not Standard Ports.
- 25 Admiralty Tide Tables, Part III, contains instructions for predicting tides and tidal streams, and for analysing observations of tides and tidal streams, with tables to assist prediction and analysis.

THE USE OF CHARTS AS NAVIGATIONAL AIDS AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

- 30 *Reliance on a chart.*—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger the scale of the chart.
- To estimate this the date of the survey, which is always given
 35 in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution.
- 40 It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of the soundings is another
 45 method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.
- It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the
 50 survey was made. The scale for publication is now generally that of the original survey, except in the case of coast sheets which are sometimes reduced. It should not, therefore be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the principal method of ascertaining

the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends, or a sonic sounding is taken, the depth over only a small area is obtained, in the case of the lead, it has a diameter of only a few inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a narrow width. 5

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast, which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor, are made on a scale of three inches to the mile, and surveys of frequented ports or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile. 10 15

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large scale coast surveys. 20

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, i.e., of 100 feet square. 25

The following diagram represents as many soundings as can be placed legibly on a square inch of paper:— 30

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8	9	10
18	17	15	12	9	7	7	7	9	10
19	16	12	9	5	4	5	6	8	9
22	19	16	10	3	5	6	7	8	10
20	16	12	7	5	6	6	7	8	10
18	15	11	9	7	7	7	8	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear weather, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may occasionally escape detection. 35

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape detection; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel with, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom. 40

General coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the ten-fathom contour line, without taking every pre- 45

caution to avoid a possible danger ; and even with surveys of harbours on a scale of 6 inches to the mile vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead may not find the highest part.

- 5 Better results can, however, be obtained by sonic sounding owing to the rapidity with which such soundings can be taken, but even this method will not find rocks unless the boat or vessel be directly over them.

- Blank spaces among soundings mean that no soundings have
10 been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep ; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion.

- 15 Soundings in hair line, which are shown on the latest charts in upright figures, and on other charts in sloping figures, indicate that such soundings have been taken from smaller scale charts, an unreliable source, or adapted from old and imperfect surveys.

- Fathom lines a caution.*—Except in plans of harbours that have been
20 surveyed in detail, the six-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In
25 general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shore in such localities without taking special precautions.

- 30 The ten-fathom line, is on rocky shores, as before mentioned, another warning, especially for ships of deep draught.

- Charts on which no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn
35 with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided as there is no knowing how closely the spot may have been examined.

- Chart on largest scale always to be used.*—It sometimes happens that
40 from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or sounding. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

- 45 *Caution in using small scale charts.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile.

- 50 For the same reason bearings to near objects should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

- 55 *Graduation.*—All plans are now being graduated in skeleton style before publication in order to facilitate easy reference to

astronomical positions ; previously published plans are also graduated as opportunity offers. The graduation is, however, of necessity often based upon imperfect information of a conflicting nature ; for this reason, whenever an astronomical position is quoted other than approximate (i.e., when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived. 5

In this connection it is pointed out that, whenever possible, a position should be transferred from one chart to another by bearing and distance from a distinguishing feature common to both, such as a point of land or a light, &c., and not by the graduation which may differ owing to one of the charts being constructed on later and more complete astronomical data than the other. 10

Distortion of printed charts.—The paper on which charts are printed is, from various causes, subject to distortion, but the effect of this is seldom sufficient to affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion. 15 20

Buoys.—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should, therefore, be regarded as warnings and not as infallible navigating marks, especially when in exposed positions ; and a ship should always, when possible, be navigated by bearings of fixed objects on shore or angles between them, and not by buoys. 25

Light-buoys.—The lights shown by light-buoys cannot be implicitly relied on, as, if occulting or flashing, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British isles are from 5 to 217 candle power. 30

Cable-buoys.—Cable-buoys marking the ends of submarine cables usually are spherical or can shaped, surmounted by a globe and occasionally a flag. Below the topmark two *white fixed* lights, disposed horizontally, may be exhibited, but they cannot be implicitly relied on. 35

Lights.—Arcs drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur. 40

All the distances given in the Admiralty List of Lights and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to elevation at the beginning of each part of the Admiralty List of Lights, affords a means of ascertaining how much more or less the light is visible should the height of the eye be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances. 45

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the standard compass. 50

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen. 55

The power of a light can be estimated by remarking its candle power, as given in the Admiralty List of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the elevation at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its elevation would permit it to be seen over 20 miles, if of any power. (See table in the Admiralty List of Lights.)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

Fog signals.—Sound is conveyed in a very capricious way through the atmosphere. The following points in regard to fog signals should be borne in mind :—

- (a) Fog signals are heard at greatly varying distances.
- (b) Under certain conditions of atmosphere, when an air fog signal is a combination of high and low tones one of the notes may be inaudible.
- (c) There are occasionally areas around a fog signal in which it is wholly inaudible.
- (d) A fog may exist a short distance from a station and not be observable from it, so that the signal may not be sounded.
- (e) Some fog signals cannot be started at a moment's notice after signs of fog have been observed.

Mariners are therefore warned that fog signals cannot be implicitly relied upon, and that *the practice of sounding should never be neglected.*

Particular attention should be given to placing "Look-out men" in positions in which the noises in the ship are least likely to interfere with the hearing of the sound of an air fog signal; as experience shows that, though such a signal may not be heard from the deck or bridge when the engines are moving, it may be heard when the ship is stopped, or from a quiet position. It may sometimes be heard from aloft though not on deck.

Great assistance may be obtained from the radiobeacons at many important lighthouses and light-vessels, but the attention of Mariners is called to the serious dangers which may arise from their misuse. No attempt should be made to approach such a position on a radio bearing, whilst relying only on hearing the sound fog signal in sufficient time to alter course to avoid danger. When the radio fog signal is transmitted from a light-vessel, it is essential in order to avoid collision, that the bearing from the light vessel should not be kept constant.

Tides.—In navigating coastal waters where the range of the tide is considerable, caution is always necessary. The tidal predictions for Standard ports in the Admiralty Tide Tables can generally be relied upon to give the times of high and low water to within a few minutes, and heights within a few tenths of a foot. Larger errors are to be expected in the predictions for places which are not Standard ports, computed from the data in Part II, but such predictions computed from the harmonic constants are always sufficiently accurate for the general requirements of navigation. For Standard Ports the heights of the tide at times between high and low water may usually be found within narrow limits in accordance with the instructions in Parts I and III of the Tide Tables.

The datums of Admiralty charts depending on Admiralty surveys vary with the type of tide, but usually conform with the International agreement, that datum should be "a plane so low that the tide will but seldom fall below it." The datums used by different nations, however, differ very considerably and those of Admiralty charts depending on foreign surveys are always those used by the original surveyors, which vary from "lowest possible low water" to "mean low water" in tidal waters, and are usually mean sea level in non-tidal waters. 5

The datum used is always stated on large scale Admiralty charts.

Caution.—Most datums are above the lowest level to which the tide may fall; the charts therefore do not always show minimum depths. 10

Tidal streams.—Where the tidal streams are semi-diurnal information regarding them is usually given, in a convenient part of the chart, in tabular form or by notes, special symbols being inserted at the positions to which the information refers. In certain cases, where the information available is incomplete, the streams are indicated by means of arrows. 16

There are many places where the tidal streams cannot be predicted by reference to the tide at a Standard Port. Although no data for predicting the times at which they flow is given, their general direction is, in many cases, indicated by arrows on the charts. For a few of the straits and channels, where these conditions exist, tidal stream predictions are given in the Admiralty Tide Tables. 20

Tidal streams, particularly if rotary, may vary considerably both in direction and rate; predictions of the stream must therefore always be considered approximate. 25

The turn of the tidal stream is not usually coincident with the times of high and low water; in fact, though in estuaries, harbour entrances, &c., the stream usually turns at about the times of high and low water, in open channels, and along open coasts generally, the turn usually occurs more nearly at half tide. Predictions of the times of high and low water must therefore never be used as predictions of the times of slack water. 30

It should be remembered that, even where the general direction of the stream is parallel with the shore, an indraught is usually experienced when crossing the entrances to bays and inlets. 36

Fixing positions.—For further information on this subject, see Admiralty Manual of Navigation.

When in sight of land, every opportunity should be taken of fixing the ship's position by terrestrial objects. 40

The most usual method is by compass bearings of suitable objects, and it must be borne in mind that a fix by only two bearings is liable to error, either an absolute error in taking the bearings, or those made in applying the deviation or in laying the bearings off on the chart. For these reasons, a third or check bearing of some other object should, when possible, be taken, especially when near the shore or dangers. The intersection of these three lines on the chart will prevent any mistakes if the objects are suitably placed. 45

The most accurate method of fixing a position is by angles between well-defined objects on the chart. All ships are supplied with a station pointer, and this method should be used whenever possible. 50

Two conditions are, however, necessary for its successful employment; first that the objects be well chosen, and, second, that the observer is skilful, and rapid in his use of the sextant and station pointer. For the former, reference can be made to the pamphlet on the use of the station pointer; the latter is only to be obtained by practice. 55

It will readily be seen that the sextant offers great advantages, as angles can be obtained from any position whence the objects are visible.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours, or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

In all cases where great accuracy of position is desired, such as the fixing of a rock or shoal, or the addition to a chart of fresh soundings or new buildings, angles should invariably be used. These should be taken to several objects, the more the better, but five objects is a good number, as the four angles thus obtained not only prevent any errors, but also furnish a means of checking the accuracy of the chart itself. When running a line of soundings, it is only necessary to take a third angle now and then; firstly to make certain that the more important soundings, as at the end of a line, are correctly placed, and, secondly, to check the general accuracy of the chart.

Attention is also directed to the very useful and handy method of fixing by the bearing and distance of a suitable object.

Should the ship be supplied with a rangefinder, its use here is obvious, but without one a very good approximate distance of an object of known height may be obtained, by observing its angle of elevation and obtaining the distance from Lecky's Offshore Distance Tables, which are supplied with all sets of charts. Full directions for the use of these Tables are given with them.

Sometimes, when only one of the requisite objects is visible from the standard compass, a compass bearing of it and a sextant angle to the other may be used to fix the position.

The method of fixing by doubling the angle on the bow is useful when passing points of land, &c., in waters where there is either no tidal stream or current, or where this can be estimated with sufficient accuracy. This method is as follows:—

Suppose that the angle between the ship's head and an object is measured, and found to be X° , and that the time of the observation is noted. Suppose also that the time is again taken when the angle between the ship's head and the object is $2X^\circ$. Then, if the course made good is the course steered, the distance of the ship from the object, at the time that the second bearing was taken, is equal to the run (over the ground) in the interval. Hence the ship's position can at once be laid off as a bearing and distance from the object. In practice, the angle X° should not be less than about 25° .

The most usual form of this method, the so-called "four point bearing," gives an excellent fix for a departure but does not ensure safety, as the point with its outlying dangers is abeam before the position is obtained.

The above fix is only reliable if either there is no tidal stream or current, or if the stream is running directly with or against the course of the ship; if otherwise, or if leeway is to be allowed for, the above method should never be used, but the ship's position should be obtained by plotting the two bearings and the estimated course and distance made good in the interval.

A table "Distance of an object by two bearings," is supplied with certain chart folios, and is also given in Inman's Tables, by which the ship's position at the time of the second bearing can be found; any two bearings at a suitable angle to each other may be used, to-

gether with the run between them, but, again, this table should not be used when the vessel is subject to a cross tidal stream or leeway.

The use of the danger angle in passing outlying dangers with land behind them, should also not be forgotten. A vertical danger angle is useful when the danger lies off an object such as a lighthouse, the height of which is known; the angle being obtained from the aforesaid Lecky's Tables. If a horizontal danger angle between two objects is used, however, caution is necessary, as, should the objects not be correctly placed on the chart, the angle taken from it may not serve the purpose. This method should not, therefore, be employed when the survey is old or manifestly imperfect. 5 10

When fixing by astronomical observations, attention is drawn to the great utility of the position line. Even a single position line may at times give invaluable information, as the ship must be somewhere on this line, provided that the chronometer is correct. 15

A sounding obtained at the same time may often serve to give an approximate position. Again, by steering along, or at a required distance parallel to, a single position line, a vessel may make her port or avoid a danger, although uncertain of her position.

A very accurate position may be obtained by observations of two or more stars at evening or morning twilight, or by the observation of a bright star at daybreak, and another, shortly afterwards, of the sun when a few degrees above the horizon. The position lines obtained from the bodies observed should differ in azimuth by 30° or more. 20

Mariners are also reminded that, with modern tables for correcting the altitude, observations of the moon entail practically no more calculation than those of a planet. Moon sights are sometimes available when stars are obscured by light cloud, &c.; also an excellent position may frequently be obtained by simultaneous observations of the sun and moon. 25 30

Great use may be made of radio bearings for fixing the ship, full details of this method, and its limitations, are given in the Admiralty List of Radio Signals.

Observations for Errors of the Compass.—No opportunity should be neglected of checking the deviations of the standard compass. When coasting, and a well surveyed and fairly large scale chart is available, an excellent method of observing the deviation is by taking the compass bearing of two suitable objects when in transit, and comparing this with the magnetic bearing from the chart; provided always that the objects are not too close together; also by using any leading lines, the true bearings of which are being indicated in degrees and minutes on the charts, when they are accurately known. When these methods are not available, the deviation should be obtained by azimuths of a heavenly body. 35 40

Deviations should be observed on any change of course on which the ship is steadied for any material space of time; if steering a steady course, the compass error should be observed at least twice a day. 45

Change of variation of the compass.—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a degree, but the chart plates cannot be corrected more 50 55

frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in
5 approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English channel about 5° in 400 miles. The Variation chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic
10 compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the
15 determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses. Magnetic Variation values shown on Admiralty charts are for the 1st July of the year mentioned.

Local magnetic disturbance of the compass on board ship.—The
20 term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that such disturbance of the compass in a ship afloat is experienced only in a few places on the globe. Magnetic laws do not permit of the supposition that it is the
25 visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in
30 the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together.

They may also be due to wrecks lying on the bottom in moderate
35 depths, but investigations have proved that, while deflections of unpredictable amount may be expected when very close to such wrecks, it is unlikely that deflections in excess of 7° will be experienced, nor should the disturbance be felt beyond a distance of 250 yards.

It is very desirable that whenever a ship passes over an area of
40 local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

Use of oil for modifying the effect of breaking waves.—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

45 The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

- 50 1. On free waves, i.e., waves in deep water, the effect is greatest.
2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.
- 55 3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing

else is obtainable ; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, 5 or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist 10 up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used. 15

8. The best method of application in a ship at sea appears to be : hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil. 20

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow—e.g., from the cathead—and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up 25 on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and 30 allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering. 35

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the depth of the water.

11. For a boat riding in bad weather from a sea anchor, it is 40 recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, 45 and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides ; if used only aft the tow alone gets the benefit.

Tropical revolving storms, and practical rules for avoiding them.—

1. Tropical revolving storms or cyclones occur for the most part 50 in the tropical or sub-tropical portions of the western sides of the great oceans, with the exception of the South Atlantic ocean where they are unknown. They occur also on the eastern sides of the North Pacific and South Indian oceans, in the Arabian sea and the Bay of Bengal.

2. Revolving storms are so named because the wind in these storms 55 revolves round an area of low pressure situated in the centre. The

direction of revolution is anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. The wind, however, does not revolve round the centre of low pressure in concentric circles but has a spiral movement inwards, towards the centre.

6 3. Tropical storms are known by various names according to the locality in which they are experienced. In the West Indies, on the Pacific coast of Central America and in the South Pacific ocean they are called hurricanes: in the Indian ocean, Arabian sea and Bay of Bengal, cyclones: and in the western part of the North Pacific, 10 typhoons.

4. These storms generally originate between the parallels of 5° and 20° of latitude in both hemispheres and as a rule have initially a progressive movement westward, subsequently recurving towards the pole of the hemisphere in which they are generated. Thereafter, 15 they tend to move north-eastward in the northern hemisphere and south-eastward in the southern hemisphere, so that they invade the temperate latitudes where they may gradually acquire the characteristics of the depressions of such latitudes.

5. Tropical storms are most frequent towards the end of the hot 20 season in both hemispheres. In the Arabian sea and Bay of Bengal, however, they have their maximum frequency and are most dangerous during the transition periods at the beginning and end of the monsoon.

6. The diameter of revolving storms may vary from twenty to some 25 hundreds of miles. Their average rate of progress when moving westward is about 10 knots, but after recurving their average speed increases to about 20 knots. It should be remembered, however, that very great variations from these speeds are likely to occur, and especially after recurving the storms sometimes move very quickly, 30 their rate of travel then occasionally being as much as 50 knots.

7. The winds associated with tropical storms are extremely violent, but in the centre, or eye of the storm, light variable breezes or squalls alternating with complete calms are usually encountered. In this region mountainous seas and a heavy confused swell are experienced. 35 Just outside the central region the strongest winds of the storm system are met, accompanied by violent squalls, and in this area, in well developed storms, it is possible that a wind speed of 150 knots in gusts may be attained. With increasing distance from the storm centre the wind generally decreases progressively. The aim of the 40 seaman should therefore be to remain as far as possible from the centre of the storm system.

8. The track followed by the centre of the storm is known as the path of the storm, and the portion of the storm field on the right of the path is called the right semi-circle, and that on the left, the left 45 semi-circle.

9. The semi-circle which lies on the side of the path towards the usual direction of recurvature, i.e., the right semi-circle in the northern hemisphere and the left semi-circle in the southern hemisphere, is known as the dangerous semi-circle. It is so called because a ship 50 caught in it may be blown towards the path over which the centre will pass, or the storm may recurve and the centre pass over her.

10. The semi-circle which lies on the side of the path away from the usual direction of recurvature is known as the navigable semi-circle. A ship situated within this semi-circle will tend to be blown 55 away from the path of the storm centre and the recurvature of the storm will increase her distance from the centre.

11. The indications of the approach of a tropical storm are :—
 - (a) A swell not caused by the wind then blowing.
 - (b) A fall in the barometer which may be divided into three phases :—
 - (i) A slow fall during which the diurnal variation is still 5
apparent, and which usually occurs from 500 to 120 miles
from the centre of the storm.
 - (ii) A distinct fall during which the diurnal variation is
almost completely masked and which usually occurs from
120 to 50 miles from the centre. 10
 - (iii) A rapid fall usually occurs from 60 to 10 miles from
the centre.
 - (c) The reading of the barometer being 2 to 3 mb. below the
normal for the time of the year is a probable indication of
the formation of a tropical storm in the vicinity. 15
 - (d) An appreciable change in force and/or direction of the wind.
 - (e) The formation of convergent streaks or bands of cirrus cloud.
 - (f) An ugly threatening appearance of the sky, and lurid sky
colourings at sunrise and sunset.
12. In order to judge the best way to act if there is reason to 20
suppose a storm is in the vicinity, a seaman requires to know :—
 - (a) the bearing of the centre of the storm ;
 - (b) the path of the centre ;
 - (c) the semi-circle in which the ship is situated.
13. If an observer faces the wind, the centre of the storm will be 25
from 12 to 8 points on his right-hand side in the northern hemisphere,
and on his left in the southern hemisphere ; 12 points at the beginning
of a storm, gradually decreasing to 8 points towards the centre.
14. The path of the storm centre can be approximately deter- 30
mined by taking two such bearings with an interval of from two to
three hours between observations, provided that there has been a wind
shift during the interval and that allowance is made for the ship's
movement. It can, however, be assumed that the storm is not travel-
ling in a southerly direction, if in the northern hemisphere, or in a
northerly direction if in the southern hemisphere ; and if in a lower 35
latitude than 15° its path is most unlikely to have an easterly com-
ponent, except in the South Pacific eastward of the 180th meridian.
15. If the wind shifts to the right the vessel is in the right semi-
circle, if to the left in the left semi-circle ; if the wind is steady in
direction but increasing in force, she is in the direct path of the storm. 40
16. A further check on the bearing and path of the storm may
often be obtained by noting the direction from which the swell is
coming and any change in this direction. The swell usually travels
directly outwards from the storm centre.
17. If in the dangerous semi-circle, i.e., the right semi-circle in 45
the northern hemisphere and the left semi-circle in the southern
hemisphere, a steam vessel should steer to windward away from
the assumed path of the storm, or stop and lie to if there is insufficient
sea room.
- A sailing vessel should heave to, on the starboard tack in the 50
northern hemisphere and on the port tack in the southern hemisphere.
18. If the seaman has reason to believe that his vessel is in the direct
path of the storm, or if in the navigable semi-circle (i.e., the left
semi-circle in the northern hemisphere and the right semi-circle in
the southern hemisphere), he should run with the wind on the star- 55
board quarter in the northern hemisphere and on the port quarter

in the southern hemisphere, away from the assumed path of the storm until the barometer begins to rise.

19. Sometimes a tropical storm moves so slowly that a vessel, if ahead of it, can easily outpace it, and if astern of it, can overtake it.

- 8 Since, however, she is unlikely to feel seriously the effects of a storm known to be in the vicinity so long as the barometer does not fall below 1005 millibars, it is recommended that frequent readings of the barometer should be made and that the vessel should continue on her course until the barometer falls to 1005 millibars or the wind increases to
10 force 6. If and when either of these events occurs, she should act as described in the preceding paragraphs until the barometer has risen to 1005 millibars or the wind decreased to force 6 or less. Should it be certain, however, that the vessel is behind the storm, or in the navigable
15 semi-circle, it will evidently be sufficient to alter course away from the centre.

20. If there is insufficient room to run when in the navigable semi-circle, a steam vessel should stop and lie to, and a sailing vessel should heave to on the port tack in the northern and on the starboard tack in the southern hemisphere.

- 20 21. If in harbour, or at anchor, a seaman should be just as careful in watching the signs and ascertaining the probable path of the storm centre, as he may be able to point his ship, or shift his berth with advantage.

22. In regions where tropical storms are encountered the local
25 meteorological services issue special warning messages by radio during the storm season giving particulars of the position and probable path of any storm which is in the vicinity. Particulars of these messages are given in the Admiralty List of Radio Signals.

IMPORTANT.

Details of Lights, Fog Signals, and Time Signals (visual) are not included in this volume ; for this information the Admiralty List of Lights, Part V, should be consulted.

Information regarding Vertical Movement of the Water is not included ; for this the Admiralty Tide Tables should be consulted.

Details of W/T information (weather bulletins, storm and navigational warnings, time signals, fog signals, and D.F. stations) are not included ; for this information the Admiralty List of Radio Signals should be consulted.

THE MEDITERRANEAN PILOT VOL. III

CHAPTER I

GENERAL REMARKS.—GREECE. — ALBANIA. — YUGOSLAVIA. — ITALY. — IONIAN SEA. — ADRIATIC SEA. — METEOROLOGY. — CURRENTS. — TIDES AND TIDAL STREAMS. — NAVIGATION OF THE ADRIATIC. — SIGNALS. — COMMUNICATIONS. — FIRING DANGER AREAS. — STANDARD TIME. — MEASURED DISTANCES. — BUOYAGE. — FUEL. — CONSULAR OFFICERS. — PILOTAGE. — DREDGERS. — TUNNY FISHERIES. — PORT REGULATIONS. — QUARANTINE. — SUBMARINE CABLES — CAUTIONS.

GENERAL REMARKS.—The portion of the Mediterranean sea described in this volume comprises that part which washes the western coast of Greece from Cape Matapan, the southern extremity of Pelopónnisos, to the Albanian frontier; the coasts of the Ionian islands; the coast of Albania; and the shores of the Adriatic sea. 5

The navigation of these regions is simple and easy, in a steam vessel, but the proximity of high mountainous land to nearly all parts has a tendency to make the winds very baffling and uncertain even in fine weather, and to cause heavy local squalls to be frequent and dangerously sudden; consequently, in a sailing vessel, extreme care is 10 required, especially in the Adriatic, where a vessel is liable to be caught in a squall without sea room, particularly during the winter.

GREECE.—General remarks.—Greece has a total area of 49,912 square miles and a population estimated, in 1937, to exceed 7,000,000. 15

Physical features.—From Cape Matapan (*Lat. 36° 23' N., Long. 22° 29' E.*), the island of Venétiko lies about 34 miles north-westward with the Gulf of Messinía (Kalamata) in between. From Venétiko, the coast trends about 200 miles north-north-westward to the Albanian frontier; within this space are the Gulfs of Patras, Corinth and 20 Amvrakía and the coast is fronted by the Ionian islands.

The characteristic features of this part of the coast are a high and picturesque sea-board, sparsely populated, deep water close inshore, and a lofty mountainous interior visible from a distance of 60 or 80 miles seaward. The exceptions as regards sea-board are chiefly in the 25 neighbourhood of the entrances to the Gulfs of Patras and Amvrakía, where the land is low and marshy. The rivers of Greece are of little

Charts 1800, 1440, 2158b.

commercial importance as they are all obstructed at their mouths by shoals, and few will admit boats.

Production and industry.—The chief agricultural products of Greece, in 1935, were wheat and other cereals, vegetables, potatoes, 5 tobacco, cotton and currants.

The chief mineral products, in the same year, were barytes, bauxite, magnesite, lead, nickel, iron, iron pyrites, emery and chrome.

The industries are mostly concerned with the production of food-stuffs, leather and metal work; there are also spinning and weaving 10 industries.

Trade and shipping.—The principal exports, in 1936, were tobacco, currants, sultanas, figs, olive oil, fresh grapes, citrus fruit, minerals, vallonias and skins.

The principal imports, in 1936, were wheat and cereals, wool and 15 woollen yarns, cotton and cotton yarns, piece goods, coal, machinery, steel and iron manufactures, mineral oils, coffee, cocoa, tea, timber, tin-plates, galvanised sheets, earthenware goods, heavy chemicals and pharmaceutical products.

Languages.—Apart from Greek, English, French and Italian are 20 widely spoken.

Currency.—Weights and measures.—The drachma of 100 lepta is the monetary unit. In 1936, the rate of exchange was based on the £ sterling, and was at the rate of 546 for buying and 550 for selling.

Nickel coinage in circulation consists of 10, 20 and 50 lepta, 1 and 25 2 drachmai; there are also pieces of 5, 10 and 20 drachmai, made of nickel and silver.

The metric system is in use in Greek customs houses.

Greek weights are as follows: 1 oke = 400 drams = 2.832 lbs. (avoirdupois). 1 kilo = 312.5 drams = 2.204 lbs. = 0.78 oke.

30 In the currant trade, the unit of weight in use (including Greek customs) is the Great Venetian Pound (G.V. lb.). 2,128 G.V. lbs. = 2,240 lbs. (avoirdupois), or 1 ton.

The unit of measurement for cloth, &c., is 1 pic = 27 inches; and the unit of measurement for land is 1 stremma = 0.2471 acre.

35 **Ports.**—The chief Greek ports described in this volume are Kalámai (Kalamata), Zante, Patras, Argostólion, Vathí in the island of Ithaca, Prevéza and Corfu; see Appendix II, page 603. For communications, see page 46.

ALBANIA.—General remarks.—Albania has a total area of 40 about 17,374 square miles and the population was estimated, in 1930, to be 1,003,124.

The Albanians, from the point of view of language, are divided into two principal groups, the Gëgs who live in the northern part and the Tosks who live in the southern; the former are further divided into 45 clans. About two-thirds of the Albanians are Muslims and of the remainder the Geg Christians in the northern part are mostly Roman Catholics, while the Tosk Christians in the southern part are members of the Greek Orthodox Albanian church.

The southern part of this country is more cultivated, more prosperous and more accessible than the northern, and there are several 50 towns, Elbasan, Berat and Tiranë, in the interior, as well as Durrës (Durazzo), and Vlönë (Valona) (*Lat.* 40° 28' N., *Long.* 19° 30' E.) on the coast.

Charts 1440, 2158a, 2158b.

The frontier between Greece and Albania reaches the coast abreast the town of Corfu and that between Albania and Yugoslavia at the mouth of the Buenë or Bojana river.

Physical features.—The Albanian coast is generally high, steep-to and sparsely inhabited, a lofty mountainous interior being visible from a long distance seaward; the exception being the coast between Cape Linguetta and the Pellg i Drinit, which is low and sandy, and the water off it is not so deep. 5

Production, Industry and Trade.—The Albanian economic system is very primitive. Great tracts of the country remain uncultivated, and the areas under cultivation are dealt with in a very primitive way. Tobacco, timber, wool, hides, furs, cheese and dairy produce, fish, olive oil, corn, cattle and bitumen are the principal products. There is a cattle-breeding industry and the local wool is made up into coarse heavy native cloth which is exported. There are vast tracts of forest land comprising oak, walnut and chestnut trees, as well as beeches, pines and firs. The mineral wealth of Albania is considerable but undeveloped. The only industries are agricultural such as flour milling, olive pressing and cheese-making. The principal exports are animal foods and fish, cereals, hides and skins; the principal imports are cotton, cotton textiles and metals. The monetary unit is the gold franc of 5 Lek, of which $25.225 = \text{£}1$ sterling. 10 15 20

Ports.—The principal Albanian ports are Sarandë, Portë e Palermos, Vlonë or Vlorë, Durrës, and Shëngjin; see Appendix II, page 603.

For communications, see page 46. 25

YUGOSLAVIA.—General remarks.—Yugoslavia was proclaimed a country on 1st December, 1918. Its total area is about 96,134 square miles and the population was estimated, in 1928, to be about 13,000,000 of which 80 per cent. are agricultural. The country is divided into nine provinces; the city of Beograd (Belgrade) forms a separate administrative unit. 30

The frontier between Albania and Yugoslavia reaches the coast at the Bojana river and that between Yugoslavia and Italy between Sušak and Fiume.

Physical features.—The coastline measures some 330 miles in a direct line, but it is so indented that the actual length is about four times as much. The coast is generally high and picturesque, with almost perpendicular cliffs and very deep water close inshore. From Dubrovnik (*Lat.* $42^{\circ} 38' N.$, *Long.* $18^{\circ} 07' E.$) to Sušak, it is entirely bordered by islands, rocks and shoals, which render navigation intricate and often unsafe, if overtaken by a Bora. The coast is backed by a high mountainous interior. 35 40

Mariners give preference to this coast rather than the Italian coast, particularly during the winter season, as it has good harbours, and, in many parts, affords shelter in bad weather. 45

Production, Industry and Trade.—There are large tracts of forest comprising beech, oak and fir trees. There are considerable mineral deposits including coal, lignite, iron, copper, gold, lead, chrome and antimony. Of the industries, flour milling, brewing and distilling, cotton spinning and weaving, tanning, boot making, pottery, iron working and carpet making are the most important. The principal crops are wheat, barley, rye, oats, maize, grapes and plums. The chief exports are cereals, cattle, horses, pigs, prunes and timber; the chief 50

Charts 1440, 2158a, 2158b.

imports are cotton and cotton goods, woollens, coal, machinery, iron and iron goods and mineral oils.

The monetary unit is the Dinar, of which, in June, 1929, 276 = £1 sterling. The metric system of weights and measures is in use.

- 5 **Ports.**—The principal ports of Yugoslavia are Kotor, Dubrovnik and Gruž, Metković, Split, Šibenik and Sušak; see Appendix II, page 603.

For communications, see page 46.

- ITALY.—General remarks.**—Italy has a total area of 119,710 square miles and the population in October, 1943, was estimated to be 45,637,000. The frontier between Yugoslavia and Italy reaches the coast between Sušak and Fiume.

- Isole Cherso, Lussino, Asinello and the islands westward of them, Lagosta, Cazza, Cazziol and the Lagostini group, Tremiti, Pianosa and 15 Pelagosa belong to Italy.

- Physical features.**—The Italian Adriatic sea-board from Capo Santa Maria di Leuca is generally low and trends north-westward as far as Ravenna, where it bends northward and forms the Venetian coast. The general uniformity of this part is broken chiefly at three places; 20 firstly at Promontorio del Gargano; secondly at Monte Conero; and thirdly at the delta of Fiume Po. The first two, being high and terminating in well-defined elevations, are excellent landmarks. The Apennines run almost parallel with the Abruzzi coast between these two elevations. Monte Conero or Gran Sasso d' Italia, 9,583 feet 25 (2920^m9) high, and Monte Maiella, 9,170 feet (2795^m0) high, which are the highest points, are remarkable and can be seen from a great distance in clear weather.

- The coast consists chiefly of sandy beaches, and, with the exception of the two points where the land rises, the depths along it are regular, 30 with a shallower approach than on the opposite coast. Roadsteads are scarce; there are many harbours, but only a few of them are capable of admitting large vessels, but which, chiefly by artificial means, have been made suitable for the busy trade carried on by local vessels, along this thickly populated coast. The great lakes Varano and Lesina are 35 celebrated for the abundance, variety and excellence of their fish.

- From Porto di Lido (*Lat.* 45° 26' N., *Long.* 12° 23' E.) the coast trends east-north-eastward to Fiume Timavo. It is low, sandy, and backed by large lagoons, of which the chief are those of Venice, Caorle, 40 Marano and Grado, and by a marshy plain intersected by numerous canals and streams, which form a network of inland waterways.

Between Porto di Trieste and Fiume, the mountainous Istrian peninsula projects about 50 miles southward. Its coasts are high and much indented, and the depths off it vary very greatly.

- The great number of rivers intersecting the north-western part of 45 the Italian sea-board from Ancona to Fiume Isonzo, bring down quantities of sand and mud, causing the shore to be encumbered with shoals, and nearly all the harbours to be more or less obstructed. This coast is, however, easily navigated in fine weather, and can be approached sufficiently near for the recognition of its most conspicuous 50 objects, which may generally be seen from a distance of 10 or 12 miles.

Production, Industry, and Trade.—There are iron, zinc, manganese, lead, sulphur ore and asphalt mines. There is a large cotton industry, silk culture is carried on extensively and the manufacture

of sugar and cheese is important. The principal crops are wheat, oats, beans, maize, grapes and olives. The chief exports are cereals, vegetables and fruit, wine, cotton, silk, hemp and other vegetable fibres, wool, minerals and stone, skins, &c. ; the chief imports are cereals, sugar, seed, fruit, cotton and cotton goods, woollens, iron and steel, 5 machinery, minerals, wood, mineral oils, skins and clothing.

The metric system of weights and measures is in use.

Ports.—The principal Italian ports in the Adriatic are Brindisi, Ancona, Venice, Trieste, Pola and Fiume. See Appendix II, pages 603, 604. 10

For communications, see page 46.

Chart 1800.

IONIAN SEA.—This sea is situated southward of the Adriatic, between the southern end of Italy, on its western side, and Greece, on its eastern side. The Ionian islands are situated in the eastern part of 15 the sea of that name.

Chart 1440.

ADRIATIC SEA.—The Adriatic sea or Gulf of Venice is the great expanse of waters which, branching off north-westward from the main body of the Mediterranean sea, is bounded by Italy to the westward 20 and northward and by Yugoslavia and Albania to the eastward.

The name *Adriatic* is derived from the city of *Adria*, founded in 1376 B.C. by an Etruscan colony and once the most important town in the Adriatic, but now in ruins ; it was situated between the mouths 25 of Fiumi Po and Adige. The name Gulf of Venice is derived from the city of that name, which was for centuries the chief city in the Mediterranean ; it is now usually applied only to the gulf or bay at the head of the Adriatic on the shores of which Venice stands.

The Adriatic, from its southern limit between Capo Sta. Maria di Leuca (*Lat. 39° 48' N., Long. 18° 22' E.*) and the island of Corfu, to 30 its northern termination at the Venetian coast and Golfo di Trieste, is about 460 miles in length in a general north-westerly direction. From Brindisi in Italy and Durrës in Albania, the sea north-westward is bounded by two nearly parallel shores, the general breadth being about 90 miles, and the greatest, between Fano and Novi, 110 miles. 35 The narrowest part is at the entrance between Capo d' Otranto and Cape Linguetta, which are rather less than 40 miles apart.

The basin of the Adriatic is slowly diminishing in size, through the deposit of silt by the rivers. From Ancona northward, numerous streams, swollen to torrents by rains in the Apennines, carry vast 40 quantities of deposit into the sea ; and, owing to the peculiar situation of the high mountains of Illyria, the head of the Gulf of Venice receives all the waters flowing from the southern declivities of the Alps and of the Slovenia mountains, situated between Fiumi Po and Isonzo ; here also flow out Fiumi Adige, Brenta, Piave, Livenza, Tagliamento, and 45 numerous minor streams, each carrying down, in freshets, great quantities of alluvium, mud, and gravel, into the lagoons, and forming vast shallows which border the intervening shore.

The effect of this deposit is perceptible along the greater part of the coast of Italy, but especially so between Punta della Maestra and 50 Punta Sdobba. Thus, the harbours of Liguentio, Romantino, and Timaro, said by Pliny to have existed on this coast, have entirely disappeared ; and *Adria*, which was a station for the Roman fleet, is now

Charts 2158a, 2158b.

Chart 1440.

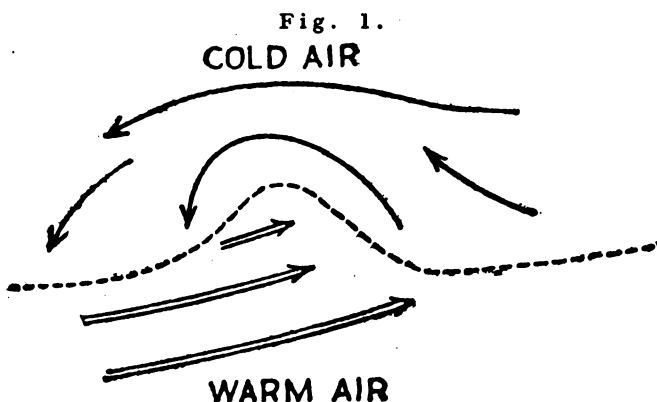
- 15 miles inland. Another town, of the name of Spina, formerly bordered by quays, is now completely buried under the sands. Ravenna, built on islands and piles on the margin of the sea, was, in the time of Theodosius the Great, a military port subject to the influence of the tide; it is now between 4 and 5 miles inland, in the midst of gardens and fields. Portus Classis, its ancient harbour, has become a marsh 4 miles from the sea, from which it is separated by a pine forest. These flat lands are subject to malaria in summer.
- 10 The colour of the Adriatic, when undisturbed, is darker than the general colour of the Mediterranean, being of a greenish hue. The specific gravity at its mouth was found by Captain Smyth to be 1.0291 at the depth of 40 fathoms.

- The two shores of the Adriatic differ entirely in aspect and character, the Italian shore being comparatively shallow, almost destitute of large ports, yet in most parts populous and abounding in provisions, water, and articles of trade; the eastern shore, on the contrary, is generally rocky, replete with islands and ports bold of approach, but deficient in inhabitants, provisions, and, in many parts, fresh water.
- 20 This peculiarity has so great an influence on the navigation of the sea that mariners cannot be too careful in making themselves acquainted with the advantages and inconveniences presented by the two shores before they decide on their route.

METEOROLOGY. — Depressions. — General remarks. — A

- 25 depression is a region of the atmosphere where pressure is lower than elsewhere. It appears on the synoptic chart as a series of isobars, roughly circular or oval in shape, surrounding an area of low pressure. It is characterised by unsettled weather and often strong winds. In the northern hemisphere, the winds blow round a low pressure in an anti-clockwise direction; there is also a slight inclination across the isobars. Thus the well known rule for the northern hemisphere is that, when an observer faces the wind, the lowest pressure is from 8 to 12 points to his right.

- According to the Norwegian theory of depressions, which has now been generally accepted, most depressions form at the boundary of

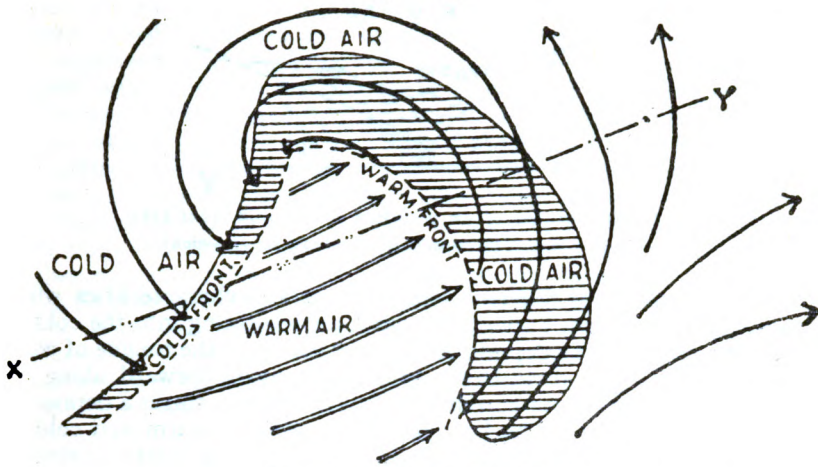


A depression forming at the boundary of two air currents.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.

Charts 2158a, 2158b.

Fig. 2a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air. The shading shows the areas where rain (or snow) is most probable.

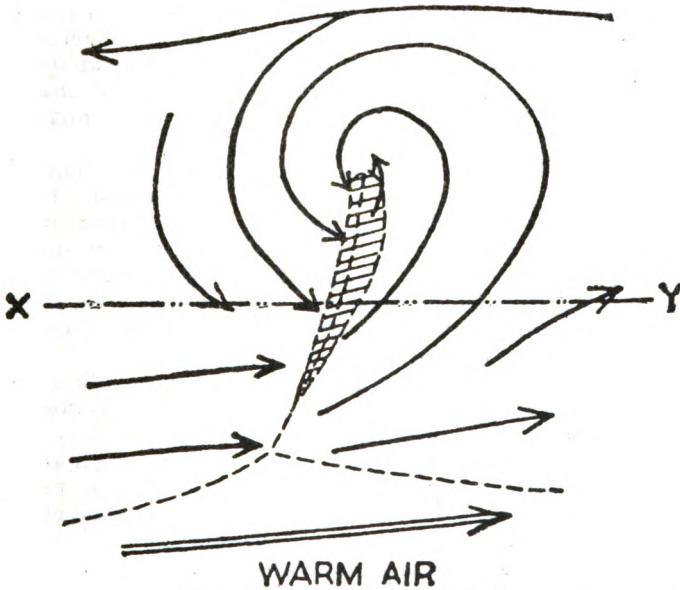
Fig. 2b.



Vertical section of the depression along the line XY.

Fig. 3a.

COLD AIR

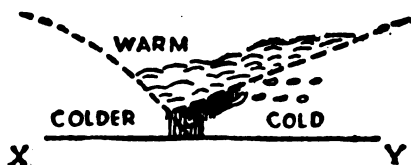


WARM AIR

Plan of an occluded depression.

The shading shows the region where rain (or snow) may be expected near the occlusion.

Fig. 3b.

*Vertical section of an occlusion of the cold front type.*

The air in front of the occlusion is warmer than the air behind it.

two air currents of different temperatures and characteristics which are in juxtaposition, a tongue of warm air projecting into the cold air and the centre of the depression being at the tip of the tongue of warm air (Fig. 1). The disturbance so formed moves forward along the boundary of the two air currents. Thus in its early stages a depression has a warm sector. The boundaries between the warm and cold air streams are known as "fronts." At the front of the warm air stream, known as the "warm front," the warm air is rising gradually over the cold air; this causes condensation of the water vapour in the warm air, forming at first cloud and later drizzle or continuous steady rain. The cloud spreads out ahead of the warm front, and the highest cloud, cirrus or mares' tails, is often about 500 miles ahead. At the rear boundary of the warm sector, known as the "cold front," the cold air is pushing under the warm air forcing the latter to ascend rapidly; this process is sometimes violent enough to produce squalls. The rapid ascent of the warm air causes the moisture to condense in the form of cumulonimbus clouds (shower clouds), from which heavy showers may fall (Fig. 2). The warm sector is thus being gradually lifted up from the earth's surface. When this has occurred, the depression is said to be "occluded," and the warm and cold fronts merge in a "line of occlusion" (Fig. 3). When a depression has become occluded, it usually decreases in intensity and rate of travel, and gradually fills up. On the other hand, a depression which has a marked warm sector is likely to be deepening the winds associated with it may increase in force and its rate of travel may increase. Depressions are usually travelling in a direction approximately parallel to the isobars in the warm sector.

Depressions may move in almost any direction, but they most often move from any one position to a position farther east; they tend to travel over the sea rather than over the land. Their rate of movement is very variable, and sometimes depressions are stationary for a time: speeds between 15 and 25 knots are common in the northern hemisphere. Depressions vary very much in size; the smallest may have a diameter of less than 100 miles, while the diameter of the largest may exceed 2,000 miles.

The approach of a depression is indicated by a falling barometer. In the northern hemisphere, if the depression is approaching from westward and passing northward of the ship, clouds appear on the western horizon, the wind shifts to south-east or south and freshens, the cloud layer gradually lowers, and finally drizzle, rain or snow begins. If the depression is not occluded, after a period of continuous rain or snow there is a veer of wind at the warm front, a rise of temperature and diminution of rain (or snow) in the warm sector, the visibility being moderate. The passage of the cold front is marked by the approach from westward of a thick bank of cloud, a further veer

of wind to west or north-west, sometimes with a sudden squall, rising pressure, a fall of temperature, squally showers of rain, hail or snow, and improved visibility (except during showers). The squally, showery weather with a further veer of wind and drop in temperature may recur while the depression passes. If the depression is occluded, the occlusion is preceded by the cloud of the warm front; there may be a period of continuous rain mainly in front of and at the line of occlusion, or a shorter period of heavy rain mainly behind the occlusion, according as the air in front is colder or warmer than that behind it. There may be a sudden veer of wind at the line of occlusion. Often another depression follows, in which case the barometer begins to fall again and the wind backs towards south-west or south.

If a depression travelling eastward or north-eastward is passing southward of the ship, the winds in front of it are easterly and they back through north-east to north or north-west; changes of direction are not likely to be so sudden as on the southern side of the depression. In the rain area there is often a long period of continuous rain and unpleasant, thick weather with low cloud. In winter, in the colder regions the weather is cold and raw and precipitation is often in the form of snow.

Near the region of lowest pressure, lulls are sometimes experienced, but sudden changes are likely, and in a deep depression the wind may increase in strength very rapidly, perhaps to gale force as the barometer begins to rise.

Sometimes in the air circulation of a large depression, usually on the equatorial side and often on a cold front, a secondary depression develops, travelling in the same direction as the primary but usually more rapidly. The secondary often deepens while the original depression decreases in intensity. In the region between the primary and the secondary depressions, the winds are not as a rule strong; but on the further side of the secondary, usually the southern side, winds are likely to be strong and they may reach gale force. Thus the development of a secondary depression may cause gales at a greater distance from the primary depression than anticipated, while there may be only light winds where gales were expected.

The above is a brief general description of depressions and the associated weather in temperate latitudes of the northern hemisphere. It must be emphasised, however, that individual depressions in different localities differ considerably from one another, according to the characteristics (especially the temperature and humidity) of the air currents of which they are composed, and the nature of the surface over which they are travelling.

Land and sea breezes.—Near the coast, the wind is influenced by the land and sea breezes, and often the actual wind experienced is not that which would be expected from the general pressure gradient existing. During the daytime, in suitable conditions a sea breeze tends to blow onshore. It usually rises gradually during the forenoon but sometimes its onset is sudden; at times it breaks suddenly as late as 1400; it reaches its maximum development in the afternoon, usually from about 1500 to 1700; it decreases in the evening and dies away around sunset. At some time after 2200, a light offshore wind, the land breeze, may spring up and last until the morning; sometimes the nights are calm and the land breeze is not felt until the early morning. Except in regions where the land slopes steeply to the coast, the sea breeze is usually more strongly developed than the land breeze. The effect of the sea (or land) breeze may be to deviate the wind due

to the general pressure gradient, to reinforce it, to neutralise it and reduce it to a calm, or even to reverse it ; in quiet anti-cyclonic conditions the land and sea breezes may be the dominating winds.

The land and sea breezes are caused by the unequal heating of the
 5 land and water under the influence of the sun's radiation. During the daytime the land is warmed up, the air over the land becomes warmer than the air over the sea, and there is a movement of air onshore ; at night, the land is cooler than the sea and the air movement is in the opposite direction. The conditions favourable to the maximum
 10 development of land and sea breezes are bright sunny days and clear nights with a weak pressure gradient and little general wind.

Land and sea breezes are much influenced by topography and vary considerably along the coasts ; it is therefore necessary to study each part of the coast to forecast the development of these breezes accurately.

15 The effect of the land and sea breezes is not usually felt more than 20 miles from the coast and often it does not extend beyond 10 miles.

Weather and climate of the coasts and waters described in this volume.—The typical Mediterranean climate with mild, rainy winters
 20 and hot, dry summers prevails in the southern part of the region. In the northern part of the Adriatic there is a more continental type of climate. Winters are rather cold, with somewhat less precipitation than in the other seasons. A strong, cold wind, the " Bora," is an important feature of the climate at this season. Summers, though
 25 hot, are not so dry as in the south, as thunder showers occur.

Pressure.—In winter, average pressure is lower over the Mediterranean than over the continents to the north and south. A centre of low average pressure lies over Sardinia and another over Cyprus. At this season, the sea is frequently traversed by depressions ; many of
 30 these are associated with Atlantic depressions, others develop over the western Mediterranean. A route often travelled in the neighbourhood of the Adriatic is from Golfo di Genova across northern Italy and thence south-eastwards to Greece. Another route is across the northern part of the Adriatic eastwards towards Hungary ; but depressions
 35 are less likely to travel along this route in midwinter, when pressure over the continent is often very high, than at other seasons. There is a tendency for depressions to remain stationary for a time when they reach the Adriatic and to deepen, during which period gales may be expected. In spring and autumn depressions are less frequent,
 40 shallower and slower-moving than in mid-winter.

In summer, average pressure decreases eastwards along the Mediterranean and in the eastern part of the sea the isobars run practically northward and southward. Depressions are infrequent from May to September.

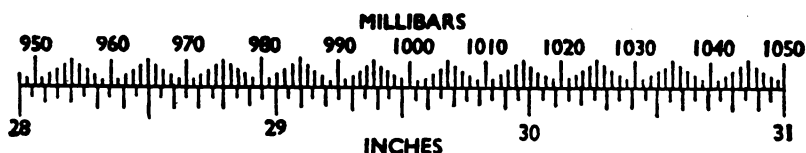
45 In a general sense, from March to April and from October to November may be regarded as transition periods between the winter and summer distributions.

Average values of pressure for each month and for the year are given for a number of stations on pages from 21 to 33.

50 The diurnal variation of pressure is small. It is discernible in settled weather, but in winter it is usually masked by the larger irregular changes.

The following scale gives the equivalent in millibars of inches of mercury and vice versa :

Charts 1800, 1440, 2158a, 2158b.



Winds.—In winter, when average pressure is high over the continent northward and lower over the Mediterranean, there is a gradient for north-easterly winds. Winds from directions between north and east are the most frequent at this season (especially in midwinter) over most of the region with the exception of the western shore of the Adriatic where off-shore north-westerly winds are, in general, the most frequent. In the winter half of the year, however, there are many travelling depressions, and these north-westerly and north-easterly offshore winds are often interrupted by winds from a southerly quarter which blow in advance of an approaching depression. Behind the cold front the northerlies set in again. As many depressions travel south-eastwards from the northern Adriatic or northern Italy, winds backing from SE. or S. to NE. are frequent on the eastern shore. On the northern and eastern shores of the Adriatic and on the western coast of Greece, the north-easterly offshore winds are much influenced by the mountains and often reach speeds much in excess of those which would be expected from the pressure gradient prevailing. In the Adriatic these strong north-easterly winds are known as “Bora.” The warm, moist winds from between south-east and south, which blow on the eastern sides of depressions, are known as “Scirocco.” The characteristics of the Bora and the Scirocco are described in detail below.

In summer, north-westerly winds are the most frequent over the open sea. Near the coasts, land and sea breezes prevail. Between May and September, inclusive, travelling depressions are infrequent and the weather is not often strongly disturbed; but local squalls are sometimes experienced near the coasts.

Winds from north-eastward, northward and westward do not raise much sea in the Adriatic, and they always enable a vessel to leave that sea.

Bora.—In its most intense form the Bora is a cold, dry wind blowing from directions between north and east down from the mountains of the northern and eastern shores of the Adriatic in violent squalls and gusts. At Trieste the hourly wind speed has averaged over 70 knots, with gusts exceeding 110 knots. This wind often sets in behind the cold front of a depression; in this case it is preceded by heavy clouds and showers of rain or snow and sometimes by fog. When the front has passed, the clouds begin to break and the Bora sets in. The cloud, temperature and humidity decrease for the first two or three days and the wind becomes very dry and biting.

The Bora also blows in winter when no definite depression is present. It is caused by an intensification of the winter anticyclone over the continent northward. Though the pressure gradient steepens, causing strong winds, the barometer remains about normal; the sky remains clear except for a few rapidly moving clouds over the mountains. Thus this type of Bora may set in without warning and is therefore dangerous, especially to small sailing craft. In mid-winter it is accompanied by very cold weather. It is likely to persist for several days

Charts 1440, 2158a, 2158b.

at a time ; on occasions it is said to have lasted as long as 30 days. Generally during long spells the Bora shows a diurnal variation, being strongest in the morning and evening and weakest at night.

It is said that the heaviest Boras are at times preceded by dense black cloud on the north-eastern horizon with light fleecy clouds above it, a rather lurid sky and an unusual stillness of the atmosphere. The general direction of the Bora being across the comparatively narrow Adriatic, a vessel unaided by steam and unable to carry sail may be driven rapidly towards the Italian coast where there is little shelter for large ships. Sailing vessels generally let fly everything to receive the first blast, then bear up southward for any port they can fetch, or remain under bare poles until the wind drops.

The Bora is strongest and most frequent in the cold season. The weaker and less frequent winds of the same type in the warm season are known as " Borino."

Scirocco.—These winds blow from a south-easterly or southerly direction in front of an approaching depression ; they are strong, warm and humid and are accompanied by heavy cloud, thick weather, rain and a heavy sea. The extent of the Scirocco winds varies according to the size and depth of the depression with which they are associated. With a large, deep depression in the western Mediterranean southerly winds may blow over the northern Sahara and Ionian sea and extend as south-easterly winds along the Adriatic. The wind is warm and dry as it leaves the coast of Africa but it rapidly picks up moisture with increasing fetch over the sea. In the Adriatic where the wind blows axially along the sea, its effects intensify from south to north ; the heavy seas become heavier northwards and the weather thicker. Approach to the ports is often impossible during thick scirocco fog. The Scirocco does not set in suddenly but the wind speed, temperature, humidity and cloud usually increase gradually for two or three days while the barometer is falling. The Scirocco is less frequent in the north of the region than in the south, and is infrequent in the extreme north of the Adriatic in midwinter. It often happens with a depression over or near the Adriatic that the Bora blows in the northern part of the sea while the Scirocco is blowing farther south.

At Isola Pelagosa Grande, according to data from two years' observations, the number of hours of south-easterly winds exceeding a rate of 27 knots which may be expected each season is, in winter 41, spring 77, summer 4, and in autumn 21.

Other local names for winds in this part of the Mediterranean are as follows :

Maestrale.—This name is applied to north-westerly winds in the Adriatic. They are frequent in summer. In winter they are most frequent on the western shore, and are often associated with the west side of depressions.

Libeccio.—These winds blow from between SSW and WSW. They are associated with the southern sides of depressions. They are often strong but are said not to be very persistent. The Italian coast is sheltered from them and they reach their greatest force on the eastern shore of the Adriatic.

Tarantata.—The Tarantata is the name given to a strong breeze from north-westward, blowing in the eastern part of the Ionian sea from the direction of Golfo di Taranto (*Lat.* 40° 26' N., *Long.* 17° 12' E.). It sometimes reaches gale force and may blow for 24 hours in

Charts 1440, 2158a, 2158b.

summer, and for two or three days in winter ; small craft have to bear up before it.

Etesians.—The north-westerly winds which prevail in summer off the western coast of Greece are known as “ Etesians ” and are similar to the well-known etesian winds of the Aegean sea. 5

Gales and strong winds.—In the south, gales occur almost entirely in the winter between November and April ; but occasionally in summer the wind may reach gale force locally for a short period in a squall. Winter gales are usually associated with depressions ; but sometimes winds reach gale force, usually from a northerly or easterly quarter, 10 when an intense anticyclone forms over the Balkans to the north and pressure is relatively low over the Mediterranean.

In the Adriatic sea, winds exceeding force 6 were recorded over a period of 5 years as follows :—

Winter :	6 days per season in the north and middle, 9 days in 15 the south.
Spring :	7 days per season in the north, 3 days in the middle, 4 days in the south.
Summer :	1 day per season in the north, 2 days in the middle, none in the south. 20
Autumn :	6 days per season in the north, 11 in the middle, none 25 in the south.

These strong winds were mainly Bora and Scirocco ; but in the south and middle of the sea strong north-westerly and westerly winds were recorded. 25

During observations extending over a period of two years at a station 300 ft. above sea level on Isola Pelagosa Grande, the total number of occasions of winds exceeding 30 knots from the four directions in the different seasons were as follows :

	Winter	Spring	Summer	Autumn
NE.	16	5	—	13
SE.	6	16	2	8
SW.	12	13	—	12
NW.	7	7	22	8

Data of the average number of days per month with gale are given 30 for a number of ports on pages from 21 to 33.

Local Winds.—*Western coast of Greece*.—In winter off the coast, winds are rather variable but in general they alternate between mild southerly winds (from between south-east and south-west) and cool winds from a northerly or north-easterly quarter. The change to the 35 cool north-easterly winds usually occurs suddenly in a squall, and is accompanied by heavy showers and sometimes by thunder. The north-easterly winds blow over high land consequently they are squally and may reach high speeds locally ; for example the wind blowing out of the Gulf of Messinía (Kalamata) is often strong and squally with 40 sudden changes of direction between north-east and south-east. The Scirocco is most frequent in autumn and in spring. At Zante its direction is between south-south-east and south-south-west ; it sometimes blows strong for two or three days ; its onset is marked by a sudden rise of from 5° to 10° in temperature and of about 10 per cent in relative 45 humidity. At Patras, it blows from south and south-west, bringing rain. Land and sea breezes are experienced in settled weather in winter, and increase considerably in spring. Near the coasts, winds

Charts 1800, 1440, 2158a, 2158b.

blowing down from the high ground are often experienced ; they are strongest when there is snow lying on the mountains. Such winds may persist for many days while in the offing there are winds from another direction. In the Gulf of Patras a north-easterly wind known
5 as the " Gulf " wind is said to blow by day for nine months of the year.

A hot, dry Scirocco, blowing from a south-easterly or easterly direction, is sometimes experienced on this coast ; it often carries dust or sand which forms a grey haze. The wind may subsequently veer south-westward with rain and thunder. This wind blows sometimes
10 at Patras for three or four days, chiefly between October and June.

In summer, north-westerly winds prevail. They are not quite so persistent as the etesians of the Aegean sea. Before they set in they are usually preceded by about a fortnight of light unsteady north-westerly winds known as " prodromæ " At Zante, for example, the
15 prodroms usually blow for 2 or 3 weeks in May as light north-westerly or westerly winds, alternating with light south-easterly or southerly winds ; the etesians proper begin in June and reach their maximum in July and August. They decrease during September, but often continue into October. It is said that these winds vary in direction during
20 the 24 hours, changing to southward of their normal direction during the forenoon and then by degrees to the northward of it, where they remain steady during the night. When bound westward sailing vessels should take advantage of the changing directions of the wind.

In the summer there are at times passing storms of short duration,
25 lasting perhaps two hours ; they are sometimes violent and, in the inner channels, are foretold by large black clouds gathering in the interior valleys of the islands and bursting in dangerous squalls over the narrow seas, accompanied by rain or hail so heavy as to shut out all view of the neighbouring land. Should the sky be threatening
30 with slight oscillations of the barometer, caution becomes necessary. At night the approach of a fresh breeze may be " heard."

Near the coasts, land and sea breezes are well developed. The land breeze is in many districts reinforced by winds blowing down from the mountains, and it may reach force 4 in favourable circumstances. In
35 the Gulfs of Patras and Corinth (*Lat.* 37° 57' N., *Long.* 22° 56' E.), it blows from north-eastward or eastward ; on the western coast of Pelopónnisos, from northward or north-eastward ; and on the southern coast of Pelopónnisos, out of the gulfs. It begins to blow two or three hours after sunset and increases in force until after midnight
40 when it decreases, falls calm at sunrise, freshens again with the rising of the sun, veering a few points eastward until about 0900, after which it dies away and is succeeded by the sea breeze. On occasions when it is strongly developed, however, it may persist until nearly noon.

The Imbatto, or sea-breeze, sets in between west-south-west and
45 north-west, generally about 1000 and at times an hour or two earlier, but rarely so late as noon. It increases in strength in the first two or three hours, attaining its maximum about 1500, when it blows fresh and then gradually decreases in force and dies away an hour or two after sunset.

50 Local thunder squalls sometimes occur in summer, in which the winds are strong and squally for a short time. Other local winds at this season are hot winds descending from the mountains.

A strong north-westerly wind which blows at times near this coast is known as " Tarantata " (see page 12).

Charts 1800, 1440, 2158a, 2158b.

Southern Adriatic.—In winter the winds are rather evenly distributed round the compass, but directions from between NE. and S. through E. are on the whole the most frequent. Westerly winds, though often blowing hard with rain in winter, are not to be dreaded, as good shelter from them can be found. Easterly and north-easterly winds are cold, 5 they sweep over the mountains of the interior, which in winter are covered with snow. The entrance is liable to very sudden gusts, and when the wind continues to blow hard the sea is short and confused, but subsides with the wind.

In summer north-westerly and northerly winds are the most frequent. 10

Central Adriatic.—Most frequent winds are north-westerly and south-easterly throughout the year; north-easterlies also are frequent in winter.

Northern Adriatic.—In winter the most frequent winds are northerly (between north-west and north-east) and south-easterly. In summer, 15 winds are rather more variable, the most frequent directions are from between north-east and south-east.

Eastern shore of Adriatic.—In winter the Bora, from between north and east, is the most frequent wind; it alternates with the south-easterly Scirocco which is more frequent in autumn than in midwinter. 20

Off Boka Kotorska (*Lat. 42° 25' N., Long. 18° 46' E.*) the Bora, though generally less violent, sometimes attains such force as to prevent the carrying of any sail, but here a vessel on standing farther out will sometimes experience less force of wind and may then be able to run for a shelter, or keep at sea. In winter this wind is dangerous, 25 especially in Uvala Vrulye, near Makarska, at the mouth of Reka Neretva, and off the valley at the head of Zuljanski zaliv, Poluotok Pelješac; and also usually between Otok Žirje and Rt Ploča, where it descends from the high land near Šibenik; also, farther northward, Zadar, Senj, Fiume and Trieste may be mentioned as affected by the 30 Bora. In autumn the Scirocco may often render impracticable, through thick weather, any approach to Boka Kotorska and the adjacent shores.

In the neighbourhood of Reka Neretva, it is said, when the clouds which generally cover the top of Mount Rukavac (*Lat. 43° 06' N., 35 Long. 17° 26' E.*), rise and break, the Bora may be confidently expected with great strength; if these clouds are scattered in the sky, the Bora is already blowing near the land though it may not have reached the offing.

In the Gulf of Quarnaro, between Capo Promontore (*Lat. 44° 46' N., 40 Long. 13° 55' E.*) and Isola Unie, the Bora gives rise to whirling gusts and a heavy sea. It sometimes blows furiously in the Planinski kanal, along the coasts of Yugoslavia, and as far as the middle of the gulf, while there is a dead calm at the islands at its entrance and in the offing. In winter, in view of the succession of Bora and Scirocco in this gulf, 45 even when a south-easterly wind is blowing hard, any signs of the Bora must be carefully watched. Not only does the Bora make navigation more difficult here than in any other part of the eastern shore, but also it has serious effects on agriculture, which has in some parts been abandoned. 50

The chief part of the maritime trade of Fiume, so far as sailing vessels are concerned, can be carried on only during the fine season, and the otherwise eligible haven of Kraljevica is almost useless on account of the Bora. Whole districts are rendered uninhabitable, and as the wind force affects the vegetation, local craft usually anchor off the 65 parts where vegetation is most abundant. It is said that when a

cloud-cap appears on the Velebit mountains a Bora is likely to set in, and a sailing vessel should not enter the Gulf of Quarnaro. The Bora is very prevalent in winter on the coast of Istria where it sweeps along the shore. It is almost impracticable in a sailing vessel to make harbour while it lasts, for on approaching land it is generally found to blow out of the inlets. South-easterly winds, in winter, become more southerly on reaching Capo Promontore, but close to the land, along the western coast of Istria, they will be found to draw eastward.

South-westerly winds are dangerous on the latter coast, on which they blow and cause a heavy sea ; although they are generally of short duration the land becomes obscured, when it is difficult to make a harbour.

The Bora sometimes obliges vessels anchored in Trieste road to seek shelter under Capo Salvore and along the coast of Istria. It is the more dangerous in the channels amongst the islands, because it generally takes vessels on the beam and there is but little room ; the mariner should at all times keep under the weather island in order to be able to bear up.

In Golfo di Trieste it is said that winds of opposite direction sometimes blow at the same time, one northward of Capo Salvore, the other between Capo Promontore (*Lat. 44° 46' N., Long. 13° 55' E.*) and Porto di Rovigno ; vessels should therefore always approach Capo Salvore with great caution if the sky be not clear north-eastward, which is said to be a sign that the Bora is blowing in the northern part of the gulf.

In summer in the south, northerly and north-westerly winds are the most frequent. Land and sea breezes are well developed all along the coast and in the north they constitute the prevailing winds. Land breezes blow at night and close inshore they are said to persist long after sunrise.

Western shore of the Adriatic.—In winter offshore winds are the most frequent, blowing from west and north-west in the south and middle and from between north-west and north-east in the north. The Bora is frequent in the north, blowing from between north and north-east ; it decreases in frequency southwards, though it may be blowing in the offing while there is an offshore wind near the coast. The Scirocco is more frequent in the south than in the north, and it becomes infrequent in the extreme north in mid-winter.

South-westerly winds sometimes blow in violent squalls off Monte Conero and Promontorio del Gargano. Off the coast between Testa del Gargano and Capo Santa Maria di Leuca, the Bora generally blows from northward except in a very heavy gale ; an offshore wind is frequent at night while the Bora is still blowing in the offing.

South-westerly winds are said to be dangerous in the vicinity of the mouths of Fiume Po where they blow in strong squalls called "Furiani," the direction shifting at times to south-east and raising a heavy sea.

In summer, land and sea breezes are the prevailing winds. Close inshore the land breeze sometimes persists until nearly noon ; it is succeeded by the sea breeze generally from southward of east until evening.

On the Venetian coast, the sea breeze is south-south-easterly and the land breeze from north-easterly to north-north-easterly. These breezes alternate regularly from June to August, but in other months of the year, northerly winds predominate at all hours. The sea breeze during summer sets in at 1000 or 1100 and ceases at 2000, but in autumn

it is delayed until 1300 and ceases at 1900 and 2000 ; its greatest speed is reached in the early afternoon. It usually begins feebly, and gradually increases ; but at times it springs up quite suddenly, and is accompanied by thick fog at the head of the Gulf of Venice. When it springs up suddenly, it is of short duration. 5

Air temperature on the coasts.—Winter is mild in the south, with day temperatures averaging about 55° in the coldest month (usually January) and night temperatures about 45° . Winters become cooler northwards and on the extreme northern shore of the Adriatic winter is rather cold, with daily maxima averaging from 40° to 45° , in 10 January, and minima averaging from 32° to 35° . Along the northern and eastern shores of the Adriatic where the Bora is very prevalent, sudden falls of temperature to low values are experienced ; for example, 14° has been recorded at Trieste and 17° at Šibenik. The Scirocco, on the other hand brings mild weather. Everywhere the temperature is 15 very fluctuating in winter on account of the changes from warm to cold winds.

The coast region of Istria has a mild climate, especially that portion eastward of Monte Maggiore (*Lat. $45^{\circ} 17' N.$, Long. $14^{\circ} 12' E.$*). Owing to its sheltered position Istria retains its Mediterranean character more 20 completely than other regions similarly situated, though the violent changes of temperature are often trying in winter.

Frosts occur, even at sea level, in the northern part of the region. In the south, frost is rare on the coast, but it occurs inland on calm, clear nights. 25

Summer is rather hot everywhere ; the decrease of average temperature northwards is much less than in winter. July and August are the hottest months, when day maxima average from 85° to 90° on the coast of Greece and a little over 80° in the northern part of the Adriatic. Maximum temperatures of 100° and over have been recorded in many 30 regions. On the western coast of Greece, the heat is relieved at those places which are exposed to the prevailing north-westerly winds, which are relatively cool ; at places sheltered from these winds or subject to hot winds descending from the high lands, summer is often unpleasantly hot. The eastern shore of the Adriatic is said to be more trying than 35 the western shore which is more open. There is not much change from day to day, and the heat has been described as "monotonous".

Data for a number of ports are given on pages from 21 to 33.

Sea Temperature.—In winter, a tongue of relatively warm water extends along the western coast of Greece and northwards along the 40 eastern shore of the Adriatic sea as far as the coast of Istria. The water is warmer from some 10 to 30 miles from the coast than near the shore, as the frequent offshore winds, particularly the Bora in the north, drive the surface water seaward and permit the upwelling of cool sub-surface water. In February, when the sea surface is coolest, the 45 average temperature in the extreme south is about 60° , it decreases northwards to 57° at Corfu, 55° at Durrës, 50° at Pola, and to 46° at Trieste. The coldest water, at an average temperature below 45° , lies off Ravenna ; temperature rises along the western shore to 52° off Testa del Gargano and 54° at the mouth of the Adriatic. 50

In spring (May) the sea temperature along the western coast of Greece averages 63° . Most of the Adriatic sea has an average temperature of from 61° to 63° , but a patch of cooler water with temperature below 60° , lies between Istria and the mouth of Fiume Po.

The water is warmest in August, when over most of the region its 55 average temperature lies between 75° and 77° . An area of cooler

water, at about 72°, lies along the eastern shore of the Adriatic sea between Hvar and the coast of Istria. From this cooler water the sea temperature increases westwards towards the middle of the sea and northwards to Golfo di Trieste, where it is again about 77°.

- 5 In autumn (November) the average temperature of the water in the extreme south is 66°. It decreases northwards to about 64° at Corfu and remains at about the same temperature along the eastern shore of the Adriatic as far north as Hvar. From an average of 61° near Zadar the temperature decreases rapidly north-westwards to the extreme
10 north-western part of the Adriatic, where along the shore from Venice to Ravenna the average temperature is 55°. Southward of Ravenna the average temperature increases to 60° off Ancona and thence slowly to about 61° off the extreme southern part of the western shore.

- Humidity.**—Average values of relative humidity are given on pages
15 from 21 to 33 for a number of ports. As would be expected, average relative humidity is highest in winter, and lowest in summer when the temperature is high. But the humidity on any particular occasion depends very much on the wind direction. Winds with a long fetch over the sea are moist; for example, the southerly winds are usually
20 damp and enervating; especially in autumn when they give heavy dews. On the other hand, offshore winds are sometimes very dry even in winter. An example of such a wind is the Bora, during the prevalence of which very low humidities are sometimes recorded. At Hvar values of 15 per cent. and under have been recorded in nearly every
25 month during the winter half of the year. Occasionally southerly winds which have originated over the desert of North Africa, when strong, are still hot and dry when they reach the western coast of Greece and south-eastern coast of Italy. Humidity may be below
30 20 per cent. in such winds. Over the Ionian sea, winds from between north-west and north-east are usually of moderate humidity, but at times in winter northerly winds are dry and biting.

Data for a number of ports are given on pages from 21 to 33.

- Cloud.**—The southern part of the region is well known for its clear
35 summer skies. At this season on the western coast of Greece skies are clear (less than 1·5 tenths) on two days out of three, and the average amount of cloud in July and August is less than one-tenth at some stations. Cloudiness increases during autumn and is at maximum in winter when it averages between 5 and 6 tenths. On the shores of the
40 Adriatic, summer skies are somewhat cloudier than on the coast of Greece; summer cloud tends to increase northwards, and in the extreme north it reaches an average of 3 or 4 tenths on the coast. The sky is occasionally, though not often, overcast.

- In winter the amount of cloud on the shores of the Adriatic averages
45 from 4 to 6 tenths. The sky is overcast on about 30 days a season at Bari in the south, about 50 days at Ancona, and on about 20 days on the northern shore. On the northern shore, overcast days are more frequent in spring and autumn than in winter. On this shore overcast skies occur chiefly with winds from between north and south-east,
50 through east. At Ancona and Bari overcast skies occur with all wind directions but most often with directions between south and north-west, through west.

- On the coasts the cloud is increased by the mountains; there is less cloud over the open sea and on small islands. On the coasts in summer
55 there is a diurnal variation of cloud owing to the formation of local cumulus in the afternoon.

Data of average cloudiness are given for a number of stations on pages from 21 to 33.

Rain and snow.—The Mediterranean distribution of rainfall with rainy winters and dry summers is very marked in the southern part of the region. For example, on the western coast of Greece most rain falls between October and March, from November to January being the wettest period, and the months from June to August are often rainless. The rainfall is mainly of the shower type and is sometimes very heavy. Occasionally heavy showers fall in summer.

The dryness of the summer season becomes less marked northwards, and in the extreme north, for example at Venice, summer has slightly more rain than winter. The summer rain chiefly falls in thunder showers.

On the coast of Istria, most of the rain falls in spring and autumn, especially the latter, these being the seasons when the Scirocco, which is the rainy wind for this region, is prevalent. The rainiest month is October. The summer months are the driest along the coast; inland there are often heavy thunderstorms in summer, and winter is the driest season. The rainfall increases with the height above sea level; on Monte Maggiore it is 127 inches, at Pola 35 inches, at Fiume 63 inches and at Trieste 43 inches. The portion of the coast of Istria which lies eastward of Monte Maggiore is comparatively wet, the average fall at Abbazia being 70 inches. The showers are usually short but very heavy.

Along the coast of Yugoslavia the average annual totals exceed 50 inches in many localities, but the rainfall varies considerably from place to place, the average fall being 56 inches at Dubrovnik and 32 inches at Šibenik. Such variations are due to the topography. At Vis only 21 inches are recorded in the average year.

Data for a number of ports are given on pages from 21 to 33. Snow is not frequent at sea level, but it may be expected on a few days each winter in the north and occasionally in the south. It is infrequent on the islands.

Thunderstorms are experienced on from about 20 to 40 days a year, varying with the locality. Pola, Split and Corfu are districts with a particularly large number of storms. In the northern part of the region, storms occur most often in the summer, but on the western coast of Greece they are most frequent in autumn, when they usher in the rainy season. They often occur at cold fronts after a Scirocco. Hail may fall at any time of the year on the shores of the Adriatic but it is not frequent; it is most likely in late winter and spring. On the western coast of Greece it is rare in the summer half of the year, but it falls occasionally in winter.

Waterspouts occur sometimes in thundery weather.

Visibility.—On the western coast of Greece visibility is said to be remarkably good as a rule, but thick weather may occur with a Scirocco at almost any time of the year. It is most likely in spring and autumn when these winds are most prevalent. Local coast and sea mist occurs at times in spring and early summer; it is said to be frequent in the early mornings of May.

In the Adriatic, visibility is usually good in most regions; but thick weather may be expected everywhere with a Scirocco at any time of the year, the weather becoming thicker from the south northwards. Local coast and sea fog occurs in spring and early summer, when the

- temperature of the water is lower than that of the air and the temperature of the sea surface is very patchy. Such fogs are said to be specially prevalent in the early mornings of May and, in the southern part of the Adriatic, in June also. In the north and at certain stations of the middle Adriatic there is frequent fog in the cooler months, fogs impeding navigation being most frequent from September to April. At Ancona, fog is frequent in winter with calm weather and is said to be dense; it is as frequent in the afternoon as in the morning. At Pesaro fogs are said to be frequent from December to March. Fog occurs in winter on the approaches to Venice; it usually clears after the early morning, but it may last all day; it has been known to persist for as long as four or five days. In summer, if the sea breeze sets in suddenly, it is sometimes accompanied by thick fog at the head of the gulf of Venice.
- 15 Data of the number of days with fog in each month are given for a number of stations on pages from 21 to 33. The following table gives for 5 stations the average number of occasions per season on which the visibility was less than 2 miles at each of the hours of observation. The data cover a period of 4 years for Kumbor and 5 years for
- 20 the other stations.

VISIBILITY

Number of days per season on which visibility was less than 2 miles.

	Winter			Spring			Summer			Autumn		
	0700	1300	1800	0700	1300	1800	0700	1300	1800	0700	1300	1800
Zadar .	6	5	6	8	6	6	3	1	1	6	4	5
Žirje. .	1	0.7	2	1	1	3	0	0	1	0.6	0.8	0.8
Split. .	1	0.2	5	1	0.4	1	1	0.2	0	0.6	1	6
Kumbor	1	0.3	1	0.5	0.3	1	0	0	0	0.5	0.3	1
Ancona .	26	27	21	13	9	10	2	1	1	11	4	3

- Mirage is fairly frequent in the Ionian sea and is probably to be observed at times locally in the Adriatic. The most frequent effects are elevation or depression of the horizon, with the corresponding increase or decrease in the distance at which objects may be seen, and
- 25 the distortion of objects near sea level.

Charts 1800, 1440, 2158a, 2158b.

MONTH	PRES- SURE at Mean Sea Level	AIR TEMPERATURE Mean of				Relative humidity		Cloud amount Scale 0—10		RAIN		WIND DIRECTION								Mean wind force Scale 0—10		No. of days with gale §	No. of days with fog	
		Daily max.	Daily min.	Highest in each month	Lowest in each month	8 a.m.	2 p.m.	8 a.m.	2 p.m.	Average Fall	No. of days with trace or more	Percentage of observations from								8 a.m.	2 p.m.			
												N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.					Calm
January	mb.	55	46	61	38	% 70	% 68	5.6	5.7	in. 4.9	8	24	19	4	5	4	15	21	8	0	3.9	4.2	0.1	0.9
February	1018	56	46	63	38	72	69	5.5	5.5	3.4	6	21	19	4	5	5	15	23	8	0	4.1	4.3	0	1
March	1016	59	49	66	41	70	67	4.9	4.8	2.1	5	19	18	4	6	4	10	30	9	0	3.8	4.1	0	2
April	1014	64	54	74	47	65	63	3.6	3.8	0.8	2	23	12	2	4	5	8	39	7	0	3.3	3.6	0	3
May	1014	72	60	81	54	61	58	3.0	3.0	0.5	1	23	16	2	2	3	6	44	4	0	3.0	3.3	0	2
June	1013	79	67	89	60	58	56	1.5	2.0	0.2	0	22	11	1	1	1	4	56	3	1	2.5	3.1	0	0
July	1011	85	72	94	65	55	53	0.4	0.6	0.0	0	29	19	0	0	0	2	48	2	0	2.7	3.3	0	0
August	1012	86	72	94	67	55	50	0.5	0.9	0.1	0	35	19	1	0	0	3	40	2	0	2.5	3.3	0	0
September	1015	81	68	88	61	60	56	1.6	2.0	0.6	1	32	22	1	1	1	5	36	2	0	2.6	3.2	0	0
October	1017	73	62	81	55	69	66	3.9	3.8	2.2	4	31	20	4	4	3	8	26	4	0	3.0	3.4	0	0
November	1017	65	55	72	46	72	69	5.1	4.9	4.1	6	25	23	4	7	5	12	19	5	0	3.7	3.9	0.3	2
December	1017	59	50	65	41	70	69	5.5	5.8	5.8	9	23	19	6	6	5	15	20	6	0	3.8	4.1	0.1	1
Means	1015	69	58	96*	35**	65	62	3.4	3.6	—	—	26	18	3	3	3	9	33	5	0	3.2	3.7	—	—
Totals	—	—	—	—	—	—	—	—	—	24.7	43	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	102†	28††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Years' Observations	29	30				10		32								10		8-9		15				

Hours of observation 0800, 1400, 2100 zone time.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature.
†† Lowest recorded temperature. § Force 9 or over on scale 0-10.

Authorities:—Athens, Annales.de l'Obs. National d'Athènes.
Res. Mens. des Obs. des Stations Meteor. de Grèce, 1923.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—ZANTE. LAT. 37° 47' N., LONG. 20° 53' E. Height above Mean Sea Level, 20 feet.
METEOROLOGICAL TABLE COMPILED FROM 30-36 YEARS' OBSERVATIONS—1894 TO 1929.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE						Relative humidity Scale 0—10		RAIN		WIND								No. of days with gale	No. of days with fog		
	For month	Mean	Mean [of]		Extreme		Cloud amount, Scale 0—10	Average Fall	† No. of days	Max. fall in a day	Percentage of observations, from													
			Daily max.	Daily min.	Highest in each month	Lowest in each month					Highest recorded	Lowest recorded	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
January . . .	mb.	1018	° F.	53	57	48	72	32	49	7.1	in.	14	3.8	21	10	7	9	10	23	10	9	1	—	—
February . . .	1016	—	° F.	53	58	47	73	30	4.9	5.3	4.4	12	4.4	19	10	6	10	11	21	10	12	1	—	—
March . . .	1015	—	° F.	56	61	50	77	37	4.0	3.4	3.4	11	3.4	13	6	4	11	18	17	11	19	1	—	—
April . . .	1014	—	° F.	60	67	54	85	41	3.7	2.2	2.9	8	2.9	8	3	3	9	27	13	11	24	2	—	—
May . . .	1014	—	° F.	68	75	60	98	47	3.7	1.2	2.2	6	2.2	5	2	2	8	16	9	14	42	2	—	—
June . . .	1014	—	° F.	75	81	67	98	55	1.8	0.3	1.5	4	1.5	4	2	2	7	9	7	14	54	1	—	—
July . . .	1013	—	° F.	80	87	72	103	60	0.6	0.1	1.5	4	1.5	4	2	2	7	5	1	14	61	1	—	—
August . . .	1013	—	° F.	81	87	72	102	57	0.8	0.4	1.3	4	1.3	4	2	2	7	5	2	13	52	2	—	—
September . . .	1016	—	° F.	75	82	69	100	56	1.8	1.4	3.1	4	3.1	12	5	3	9	9	9	11	41	1	—	—
October . . .	1016	—	° F.	68	74	62	96	49	3.5	5.1	7.0	10	7.0	9	7	6	12	11	21	12	21	1	—	—
November . . .	1016	—	° F.	61	67	56	83	37	4.7	8.1	6.1	13	6.1	13	10	7	12	13	24	8	12	1	—	—
December . . .	1016	—	° F.	56	60	51	71	36	5.1	9.2	6.9	16	6.9	16	8	8	12	10	28	8	10	0	—	—
Means . . .	1015	—	° F.	65	71	59	—	—	3.2	—	—	—	—	11	6	4	10	12	15	11	30	1	—	—
Totals . . .	—	—	° F.	—	—	—	103	30	—	43.8	100	—	7.0	—	—	—	—	—	—	—	—	—	—	—
Extreme values . . .	—	—	° F.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations . . .	30	—	° F.	30	30	—	30	30	—	36	—	36	—	30	30	—	—	—	30	—	—	—	—	—

Hours of observation, 0800, 1400, 2000 E.E.T. † Mean of 24 hours.

‡ Day with trace or more rain.

Authorities :—MS. supplied by Observatoire Royal, Athens.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—PATRAS. LAT. 38° 15' N., LONG. 21° 44' E. Height above Mean Sea Level, 131 feet.
METEOROLOGICAL TABLE COMPILED FROM 9-42 YEARS' OBSERVATIONS 1870 TO 1875; 1894 TO 1929.

MONTH	PRES- SURE at Mean Sea Level	AIR TEMPERATURE Mean of				Relative humidity		Cloud amount Scale 0—10		RAIN		WIND DIRECTION								Mean wind force Scale 0—10		No. of days with gales §	No. of days with fog			
		Daily max.	Daily min.	Highest in each month	Lowest in each month	8 a.m.		2 p.m.		Average Fall	No. of days with trace or more	Percentage of observations from								8 a.m.	2 p.m.					
						° F.	° F.	° F.	° F.			%	%	N.	NE.	E.	SE.	S.	SW.					W.	NW.	Calm
January	mb.	57	44	63	35	79	64	5-9	5-9	in.	13	21	17	13	11	15	7	8	4	2-2	3-0	0-4	0-4			
February	1017	58	44	67	35	77	60	5-6	5-6	3-1	12	22	15	12	10	14	9	10	4	2-3	3-2	0-7	0-5			
March	1015	62	47	73	39	75	56	4-8	4-8	2-6	10	20	15	11	8	14	10	14	4	2-1	3-3	0-1	2			
April	1014	69	53	80	45	73	55	4-1	4-4	2-0	9	18	12	8	5	14	12	21	6	2-2	3-5	0-1	1			
May	1014	77	59	87	52	70	51	3-4	4-1	1-3	7	18	8	6	5	13	12	26	7	2-1	3-3	0	1			
June	1014	84	66	93	59	67	48	2-0	2-7	0-6	5	12	4	6	5	14	13	35	6	2-1	3-4	0	0-3			
July	1013	90	70	98	64	61	40	0-3	0-6	0-1	1	15	8	6	4	11	13	31	7	1-9	3-7	0	0-1			
August	1013	90	71	99	65	65	41	0-5	0-8	0-2	2	18	8	7	5	12	14	23	6	1-4	3-6	0-1	0-9			
September	1016	84	67	93	60	70	47	1-5	1-7	1-1	5	19	12	11	8	11	10	18	4	1-5	3-3	0	0-2			
October	1017	75	60	84	53	79	59	3-7	3-8	3-6	11	21	14	13	11	10	7	15	3	1-8	2-8	0-3	0-6			
November	1017	66	53	76	43	79	63	5-1	5-1	4-5	12	23	18	13	11	9	8	10	3	2-1	2-9	0-1	0-7			
December	1017	59	47	67	38	80	67	5-6	5-4	4-9	14	19	18	13	11	14	8	8	3	2-2	2-8	0-2	1			
Means	1015	73	57	100*	32**	73	54	3-5	3-7	—	—	19	12	10	8	13	10	18	5	2-0	3-2	—	—			
Totals	—	—	—	—	—	—	—	—	—	27-9	101	—	—	—	—	—	—	—	—	—	—	2	—			
Extreme values	—	—	—	110†	25††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
No. of Years' observations	29	39				10		9-10		40	26	42								10		21	11			

Hours of observation 0800, 1400, 2100 zone time.

* Mean of highest each year.

** Mean of lowest each year.

†† Lowest recorded temperature.

‡ Highest recorded temperature.

§ Force 9 or over on Scale 0-10.

Authorities :—London, Q.J.R. Meteor. Soc. Vols. II and III; 1873-77.
Athens, Annales de l'Obs. National d'Athènes, etc.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—AFYION. LAT. 38° 15' N., LONG. 22° 05' E. Height above Mean Sea Level, 203 feet.
METEOROLOGICAL TABLE COMPILED FROM 7-18 YEARS' OBSERVATIONS—1904 TO 1921.

MONTH	PRES- SURE at Mean Sea Level		AIR TEMPERATURE Mean of				Relative humidity		Cloud amount Scale 0—10		RAIN		WIND DIRECTION								Mean wind force Scale 0—10		No. of days with gale §	No. of days with fog		
	Mean		Daily max.	Daily min.	Highest in each month	Lowest in each month	8 a.m.	2 p.m.	8 a.m.	2 p.m.	Average Fall	No. of days with trace or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	8 a.m.			2 p.m.	
January	mb.	1018	° F.	55	44	64	35	%	76	69	6-1	in.	10	7	3	6	29	10	19	10	16	0	1-8	2-2	0	0
February		1016	55	44	64	35	66	75	5-8	5-5	2-4	10	5	2	6	28	15	17	10	17	0	1-9	2-6	0	0	
March		1015	60	47	70	40	63	74	5-2	5-3	2-3	9	10	3	7	26	13	15	9	17	0	2-0	2-6	0	0-3	
April		1013	66	52	76	44	72	59	4-6	5-3	1-3	8	16	4	4	26	8	9	9	24	0	1-8	2-5	0	0-1	
May		1014	75	58	85	50	71	55	3-9	4-9	1-3	7	20	6	4	24	10	6	5	25	0	1-9	2-6	0	0-4	
June		1013	83	65	93	58	67	51	2-1	3-2	0-3	3	28	7	3	18	5	4	5	30	0	1-8	2-6	0	0	
July		1012	90	70	98	63	67	49	0-4	0-9	0-1	1	29	7	4	20	5	3	3	29	0	1-9	2-8	0	0	
August		1013	91	71	99	66	65	47	1-1	1-6	0-3	2	22	9	5	24	5	6	4	25	0	1-9	2-8	0-1	0	
September		1015	84	67	93	59	64	51	2-1	2-5	0-7	3	14	6	6	28	8	9	5	24	0	1-9	2-8	0	0-1	
October		1018	73	60	83	52	72	62	4-5	4-5	2-8	8	8	3	4	29	12	20	7	17	0	1-9	2-3	0	0-3	
November		1017	63	52	73	42	77	70	6-3	6-3	4-5	12	6	2	6	25	16	20	8	17	0	2-1	2-3	0	0	
December		1017	59	47	66	38	77	70	5-7	5-8	3-4	10	8	2	6	21	16	20	9	18	0	1-8	2-1	0	0	
Means		1015	71	56	101*	31**	71	59	4-0	4-3	—	—	14	5	5	25	10	12	7	22	0	1-9	2-5	—	—	
Totals		—	—	—	—	—	—	—	—	—	22-7	83	—	—	—	—	—	—	—	—	—	—	—	—	—	
Extreme values		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations		15	18	17-18				10		9-10		18		10								10		12-13	7	

Hours of observation 0800, 1400, 2100 zone time.

* Mean of highest each year.

** Mean of lowest each year.

†† Lowest recorded temperature.

‡ Highest recorded temperature.

§ Force 9 or over on scale 0-10.

Authority :—Athens, Annales de l'Obs. National d'Athènes.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—CORFU. LAT. 39° 37' N., LONG. 19° 55' E. Height above Mean Sea Level, 105 feet.
 METEOROLOGICAL TABLE COMPILED FROM 9-55 YEARS' OBSERVATIONS—1852 TO 1861; 1869 TO 1879; 1894 TO 1929.

MONTH	PRES- SURE at Mean Sea Level		AIR TEMPERATURE Mean of				Relative humidity		Cloud amount Scale 0—10		RAIN		WIND DIRECTION								Mean wind force Scale 0—10		No. of days with gale §	No. of days with fog								
	Mean	Mean	Daily max	Daily min	Highest in each month	Lowest in each month	8 a.m.	2 p.m.	8 a.m.	2 p.m.	Average Fall	No. of days with trace or more	Percentage of observations from								8 a.m.	2 p.m.										
													N.	NE.	E.	SE.	S.	SW.	W.	NW.					Calm							
January	1017	56	44	62	36	82	73	5-5	5-7	in.	12	8	9	6	12	16	14	6	10	19	2-2	2-6	0-3	4								
February	1015	57	44	64	36	79	71	5-6	5-5	5-3	11	7	6	5	20	13	9	5	11	20	2-4	2-9	0-4	1								
March	1014	61	47	69	39	80	72	4-6	5-1	3-9	9	6	5	5	14	16	9	10	12	23	2-0	2-8	0-1	2								
April	1013	67	52	75	44	79	71	4-6	4-5	3-0	9	6	3	7	15	14	13	8	13	21	2-1	3-0	0-1	3								
May	1013	75	58	83	51	78	68	3-4	3-4	1-8	6	8	8	10	10	14	10	8	12	20	1-6	2-4	0-1	1								
June	1013	82	65	89	58	77	65	2-5	2-8	0-9	4	12	8	6	11	11	8	8	16	20	1-6	2-5	0-1	0-5								
July	1012	87	69	94	63	71	58	0-7	0-7	0-2	2	13	9	10	5	10	5	6	21	21	1-3	2-4	0	3								
August	1013	88	69	94	64	72	56	1-2	1-2	0-8	2	13	6	8	6	8	4	8	18	29	1-1	2-1	0-1	4								
September	1015	82	65	90	58	76	62	2-9	2-6	3-0	5	10	6	8	9	13	9	9	13	23	1-3	2-3	0	3								
October	1016	74	60	81	52	80	70	4-2	4-6	6-7	10	6	7	6	13	15	11	11	8	23	1-7	2-2	0-1	5								
November	1016	66	53	74	43	81	73	5-5	6-0	7-3	11	8	9	7	14	13	12	7	8	22	2-1	2-3	0-1	3								
December	1015	59	48	66	38	82	74	6-2	6-0	8-5	14	10	10	6	16	13	10	6	9	20	2-3	2-5	0-1	3								
Means	1014	71	56	96*	32**	78	68	3-9	4-0	—	—	9	7	7	12	13	10	8	12	22	1-8	2-5	—	—								
Totals	—	—	—	—	—	—	—	—	—	47-7	95	—	—	—	—	—	—	—	—	—	—	—	—	—								
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
No. of years' observations	29-30	41	44	42	44	9-10				55	25-26	17								9		20-21	13									

Hours of observation 0800, 1400, 2100 zone time.

* Mean of highest each year.

†† Lowest recorded temperature.

** Mean of lowest each year.

‡ Less than 0-05.

† Highest recorded temperature.

§ Force 9 or over on scale 0-10.

Authorities :—Partsch, J. Die Insel Korfu, Petermann's *Ergänzungsband*, 19, 1888.
 Athens, *Annales de l'Obs. National d'Athènes*, etc.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—DURRËS. LAT. 41° 19' N., LONG. 19° 28' E. Height above Mean Sea Level, 23 feet.
METEOROLOGICAL TABLE COMPILED FROM 2-15 YEARS' OBSERVATIONS—1868 TO 1884.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE						Relative humidity Scale 0-10		RAIN		WIND								† No. of days with gale or strong wind	No. of days with fog		
	Mean		Mean [of]		Extreme		%	Cloud amount, Scale 0-10	Average Fall	† No. of days in a day	Max. fall in a day	Percentage of observations, from												
	For month	Daily ampli- tude	Daily max.	Daily min.	Highest in each month	Lowest in each month						Highest recorded	Lowest recorded											
							° F.	° F.	° F.	° F.	° F.			° F.	N.	N.E.	E.	S.E.	S.	SW.	W.		N.W.	Calm
January . . .	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	in.	in.	in.	in.	38	16	12	18	4	3	2	2	5	2	1	
February . . .	1018	—	47	—	57	30	63	23	77	4.4	3.0	1.7	1.4	33	13	8	19	8	6	4	5	4	0	
March . . .	1017	—	48	—	59	31	63	21	74	4.1	3.3	1.4	1.4	25	12	9	18	8	9	6	9	4	0	
April . . .	1014	—	52	—	64	35	72	27	73	4.4	4.0	1.4	1.4	23	10	13	11	8	3	3	16	6	0.5	
May . . .	1012	—	58	—	70	45	79	40	72	3.9	2.2	1.3	1.3	19	6	14	12	9	5	20	7	2	1	
June . . .	1013	—	65	—	77	53	84	49	73	3.2	1.6	1.7	1.7	24	8	12	11	7	5	4	19	10	0	
July . . .	1014	—	72	—	83	61	88	57	71	2.4	1.9	1.0	1.0	41	4	8	8	2	1	24	10	1	0	
August . . .	1013	—	77	—	88	65	93	60	68	1.1	0.5	2	2.5	30	7	9	10	3	3	4	27	7	0	
September . . .	1015	—	76	—	88	63	95	55	71	1.5	1.9	4	2.8	38	12	8	19	8	7	5	4	17	6	0
October . . .	1016	—	71	—	83	53	89	42	73	1.8	1.7	4	4	29	12	8	19	8	7	5	3	2	1	
November . . .	1015	—	64	—	75	47	81	44	78	3.9	6.6	4.3	4.3	31	14	9	24	8	5	3	2	2	0	
December . . .	1015	—	55	—	64	37	70	34	79	5.0	8.4	3.8	3.8	27	13	10	24	10	7	3	2	2	0.5	
Means . . .	1014	—	61	—	89°	26**	—	—	74	3.4	—	—	—	30	10	10	15	7	6	4	12	6	—	
Totals . . .	—	—	—	—	—	—	—	—	—	—	42.5	97	4.3	—	—	—	—	—	—	—	—	—	5	
Extreme values . . .	—	—	—	—	—	—	95	21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations . . .	15	—	(50)	—	—	—	9	—	8.9	—	—	—	—	—	—	—	—	—	—	—	—	—	2	

Hours of observation 0700, 1400, 2100 zone time.

° ‡ (0700 + 1400 + 2 × 2100) reduced to 1851-1900.

† Day with trace or more rain.

** Mean of highest each year.

† Force 6 or over on scale 0-10.

** Mean of lowest each year.

Authorities:—Meteor. Zs. XXXI, 1914, p. 190.

Vienna, Jahrbuch. der K. K. Zentralanstalt, etc.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—DUBROVNIK. LAT. 42° 38' N., LONG. 18° 07' E. Height above Mean Sea Level, 49 feet.
METEOROLOGICAL TABLE COMPILED FROM 10-31 YEARS' OBSERVATIONS—1870 TO 1896; 1910 TO 1914.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE						Relative humidity Scale 0—10	RAIN		WIND								† No. of days with gale or strong wind	No. of days with fog				
	For month	Mean	Mean [of]		Mean \$ [of]		Extreme \$		%	Average Fall	† No. of days	Max. fall in a day	Percentage of observations, from												
			Daily max.	Daily min.	° F.	° F.	° F.	° F.					° F.	° F.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm		
January . . .	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	in.	in.	12	5-9	11	33	10	18	3	4	2	4	15	3	0		
February . . .	1016	—	47	—	—	57	34	61	24	61	5-0	7-5	12	2-6	13	24	13	18	2	3	4	6	17	2	0
March . . .	1014	—	52	—	—	67	39	78	29	64	4-9	4-9	12	4-0	11	17	8	26	3	6	4	6	19	2	0-2
April . . .	1012	—	58	—	—	71	47	82	42	66	4-8	5-1	13	3-7	8	12	7	31	4	5	5	8	20	1	0
May . . .	1013	—	65	—	—	79	56	88	47	66	3-1	3-1	9	2-5	7	9	6	26	2	5	5	10	30	0-7	0-3
June . . .	1014	—	72	—	—	83	63	90	58	65	2-8	2-8	7	5-1	6	9	3	24	2	3	9	13	31	0-6	0
July . . .	1013	—	77	—	—	88	68	93	63	63	1-7	1-8	4	2-1	7	12	3	19	2	3	5	16	33	0-3	0
August . . .	1013	—	76	—	—	86	68	90	60	62	1-7	1-9	4	3-5	6	16	3	20	2	4	3	16	30	0-5	0-2
September . . .	1015	—	72	—	—	82	61	87	54	66	3-0	4-6	7	4-0	4	21	4	23	2	5	1	12	28	0-6	0
October . . .	1016	—	64	—	—	76	52	84	38	68	4-6	7-6	12	5-6	8	16	4	31	4	6	4	5	22	2	0
November . . .	1015	—	56	—	—	67	43	70	36	66	5-2	6-1	12	4-0	11	22	8	26	3	5	5	15	2	0	
December . . .	1016	—	50	—	—	61	37	65	27	65	5-3	7-1	13	5-6	11	28	10	22	3	4	3	4	15	3	0
Means . . .	1014	—	61	—	—	88*	30**	—	—	64	3-9	—	—	8	18	7	24	3	4	4	9	23	—	—	
Totals . . .	—	—	—	—	—	—	—	—	—	—	—	56-6	114	—	—	—	—	—	—	—	—	—	18	0-7	—
Extreme values	—	—	—	—	—	—	—	93	24	—	—	—	5-9	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations .	31	—	31	—	—	—	—	—	—	19	19	19	19	19	19	19	19	19	19	19	19	19	17	11-12	—

Hours of observation 0700, 1400, 2100 zone time.

* Mean of highest each year.
† Day with trace or more rain.

** Mean of lowest each year.
‡ (0700 + 1400 + 2100).

§ From observations at 0700, 1400, 2100.
† Force 6 or over on scale 0-10.

Authorities :—Buchan, A., "Challenger" Report on Atmospheric Circulation.
Vienna, Jahrbuch der K. K. Zentral-anstalt.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—VIS. LAT. 43° 04' N., LONG. 16° 12' E. Height above Mean Sea Level, 79 feet.

METEOROLOGICAL TABLE COMPILED FROM 25-40 YEARS' OBSERVATIONS—1870 TO 1909.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE								Relative humidity Scale 0-10	RAIN		WIND										§ No. of days with gale or strong wind	No. of days with fog
	For month	Daily ampli- tude	Mean [of]		Mean [of]		Extreme		Cloud amount Scale 0-10	Average Fall	‡ No. of days in a day	Max. fall in a day	Percentage of observations, from												
			Daily max.	Daily min.	Highest in each month	Lowest in each month	Highest recorded	Lowest recorded					N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm				
January . . .	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	%	in.	in.	2-2	15	10	17	19	7	3	5	23	1	1	0-2		
February . . .	1016	—	—	—	59	36	63	21	74	2-3	2-3	2-2	13	10	16	20	8	2	7	23	2	1	0-1		
March . . .	1015	—	—	—	59	36	63	28	74	1-7	1-7	1-4	11	6	12	28	9	3	9	22	3	0-8			
April . . .	1012	—	—	—	63	40	68	30	76	1-7	1-7	2-4	7	5	10	30	10	2	12	30	4	0-4			
May . . .	1011	—	—	—	67	47	72	40	78	1-2	1-2	2-8	6	2	6	28	10	2	13	38	5	0-5			
June . . .	1013	—	—	—	76	54	82	48	77	3-6	3-6	3-5	6	3	4	20	9	2	13	38	5	0-5			
July . . .	1013	—	—	—	82	62	88	54	74	3-0	1-0	1-8	8	3	4	20	9	2	12	30	4	0-4			
August . . .	1014	—	—	—	87	67	93	61	71	0-5	3	2-2	8	3	3	13	8	1	11	45	6	0-2			
September . . .	1015	—	—	—	86	67	91	62	72	1-8	0-9	3-1	7	3	4	16	8	1	14	44	5	0-2			
October . . .	1014	—	—	—	81	61	87	51	76	2-7	1-7	3-1	8	4	8	21	8	2	9	35	5	0-2			
November . . .	1015	—	—	—	75	53	80	42	78	4-3	2-8	7-0	8	5	9	29	12	4	7	24	2	0-7			
December . . .	1014	—	—	—	67	45	71	34	75	2-8	2-8	2-9	12	8	12	23	12	4	6	22	1	1			
					61	39	67	30	75	4-8	3-0	2-7	14	9	15	20	11	4	6	20	1	2			
Means . . .	1014	—	—	—	88*	32**	—	—	75	3-6	—	—	10	6	10	22	9	2	9	29	3	—	—		
Totals . . .	—	—	—	—	—	—	—	—	—	—	21-3	7-0	—	—	—	—	—	—	—	—	—	10	4		
Extreme values . . .	—	—	—	—	—	—	93	21	—	—	—	—	—	—	—	—	—	—	—	—	—	25-26	26-26		
No. of years' observations	40	—	—	—	—	—	38	38	—	—	37-38	—	—	—	—	—	—	—	—	—	—	25-26	26-26		

Hours of observation 0700, 1400, 2100 zone time.

* Mean of highest each year.

** Mean of lowest each year.

† Day with trace or more rain.

‡ Force 7 or over on scale 0-10.

Authorities:—Vienna, Jahrbuch. der K. K. Zentral-anstalt.

Trieste, Rapporto Annuale dell' Osservatorio Marittimo.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE.—SIBENIK. LAT. 43° 43' N., LONG. 15° 54' E. Height above Mean Sea Level, 16 feet.
 METEOROLOGICAL TABLE COMPILED FROM 10-27 YEARS' OBSERVATIONS—1885 TO 1912.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE								Relative humidity Scale 0—10		RAIN		WIND								§ No. of days with gale or strong wind	No. of days with fog		
	For month	Mean ampli- tude	Mean [of]		Mean [of]		Extreme		Cloud amount, Scale 0—10	Average Fall	†No. of days	Max. fall in a day	Percentage of observations, from													
			Daily max.	Daily min.	Highest in each month	Lowest in each month	Highest recorded	Lowest recorded					N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm					
January . . .	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	%	in.	9	in.	13	36	3	16	3	5	3	0	1	2	4	26	3	1
February . . .	1018	—	42	50	36	58	27	62	17	80	4.2	2.4	11	30	2	18	5	5	2	2	2	4	26	3	0.2	
March . . .	1016	—	45	52	38	59	31	68	23	79	4.5	2.6	9	20	2	19	8	6	6	5	5	5	26	3	0.2	
April . . .	1014	—	50	58	42	65	34	71	23	78	4.3	2.2	8	20	1	18	8	6	6	6	4	29	3	0.6		
May . . .	1013	—	56	64	47	73	41	83	33	76	4.0	2.2	9	20	1	18	8	6	6	6	4	29	3	0.6		
June . . .	1014	—	64	73	55	81	49	87	43	77	3.7	2.8	8	20	1	18	8	6	6	6	4	29	3	0.6		
July . . .	1014	—	72	81	62	88	58	99	50	72	2.9	2.4	7	14	2	14	8	7	8	6	4	29	3	0.6		
August . . .	1014	—	76	85	66	93	62	101	54	68	2.0	1.4	4	14	2	14	8	7	8	6	4	29	3	0.6		
September . . .	1015	—	75	84	66	92	61	103	54	71	1.8	1.3	4	16	1	14	9	8	11	5	34	0.7	0			
October . . .	1017	—	68	77	60	85	53	95	43	77	2.7	2.6	4	16	2	14	9	8	11	5	34	0.7	0			
November . . .	1016	—	61	68	54	76	45	86	36	82	3.9	4.3	6	16	2	14	9	8	11	5	34	0.7	0			
December . . .	1017	—	52	59	45	68	35	82	29	80	4.4	4.7	8	19	3	18	8	4	5	5	27	2	0.1			
Means . . .	1016	—	46	53	40	61	30	68	21	80	4.6	3.4	11	29	2	20	5	2	1	3	27	3	0.4			
Totals . . .	1015	—	59	67	51	95*	25**	—	—	77	3.6	—	—	10	22	2	14	6	4	6	5	31	—	—		
Extreme values	—	—	—	—	—	—	—	103	17	—	—	32.3	93	—	—	—	—	—	—	—	—	—	—	25	4	
No. of years' observations .	22	—	24	16-	17	17	24	24	24	26-27	—	—	—	—	—	—	—	—	—	—	—	—	—	23	10	

Hours of observation 0700, 1400, 2100 zone time.

* Mean of highest each year.

** Mean of lowest each year.

† Day with trace or more rain.

§ Force 6 or over on Scale 0-10.

Authorities :—Vienna, Jahrbuch. der K. K. Zentral-anstalt.

Pola, Meteor. Termin-beobachtungen in Pola und Sebenico.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—FIUME. LAT. 45° 19' N., LONG. 14° 27' E. Height above Mean Sea Level, 16 feet.

METEOROLOGICAL TABLE COMPILED FROM 26-46 YEARS' OBSERVATIONS—1861 TO 1906.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE								Relative humidity		RAIN		WIND										\$ No. of days with gale or strong wind	No. of days with fog																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Mean		Mean [of]		Extreme		Mean [of]		Extreme		Average		Average Fall		Max. fall in a day		Percentage of observations, from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

Hours of observation 0700, 1400, 2100 zone time.

* Mean of highest each year. ** Mean of lowest each year. † Day with trace or more rain. § Force 6 or over on scale 0-10.

Authorities:—Fiume, Meteor. Beobachtungen an der K. u. K. Marine-Akademie.
Vienna, Jahrbuch. der K. K. Zentral-anstalt.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—BRINDISI. LAT. 40° 38' N., LONG. 17° 57' E. Height above Mean Sea Level, 10 feet.
METEOROLOGICAL TABLE COMPILED FROM 7-32 YEARS' OBSERVATIONS—1880 TO 1913.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE										Relative humidity Scale 0—10		RAIN		WIND										No. of days with fog	No. of days with gale
	For month	Mean	Average		Mean		Extreme		° F.	° F.	° F.	%	in.	No. of days	Max. fall in a day	Percentage of observations, from												
			Daily max.	Daily min.	Highest in each month	Lowest in each month	Highest recorded	Lowest recorded								N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm				
January . . .	mb.	1019	—	—	—	—	—	—	—	—	—	—	3.9	10	in.	3.9	21	10	3	9	19	6	13	16	3	—	0.3	
February . . .	—	1015	—	—	—	—	—	—	—	—	—	—	2.5	8	2.8	18	5	3	12	20	10	13	17	2	—	0.2		
March . . .	—	1015	—	—	—	—	—	—	—	—	—	—	4.4	6	2.9	22	2	3	12	22	9	12	15	3	—	0.3		
April . . .	—	1013	—	—	—	—	—	—	—	—	—	—	2.2	7	3.9	13	1	3	12	23	10	18	17	3	—	0.1		
May . . .	—	1014	—	—	—	—	—	—	—	—	—	—	3.3	5	4.8	11	1	2	12	18	8	13	27	8	—	0.2		
June . . .	—	1014	—	—	—	—	—	—	—	—	—	—	1.6	3	3.2	16	2	1	7	15	6	20	24	9	—	0.1		
July . . .	—	1014	—	—	—	—	—	—	—	—	—	—	0.9	3	3.2	16	2	1	7	15	6	20	24	9	—	0.1		
August . . .	—	1015	—	—	—	—	—	—	—	—	—	—	0.5	2	2.8	18	3	1	3	9	4	21	31	10	—	0		
September . . .	—	1016	—	—	—	—	—	—	—	—	—	—	1.1	2	5.2	16	1	2	4	10	5	22	30	10	—	0		
October . . .	—	1017	—	—	—	—	—	—	—	—	—	—	2.1	4	4.8	24	2	1	7	16	6	21	18	5	—	0.1		
November . . .	—	1016	—	—	—	—	—	—	—	—	—	—	3.3	8	3.1	18	2	2	10	22	5	16	19	6	—	0.3		
December . . .	—	1015	—	—	—	—	—	—	—	—	—	—	3.2	7	3.9	19	3	4	8	21	11	16	16	2	—	0.3		
Means . . .	—	1015	—	—	—	—	—	—	—	—	—	—	3.7	10	4.1	15	4	4	13	22	8	17	16	1	—	0.2		
Totals . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	27.3	72	5.2	—	—	—	—	—	—	—	—	—	—	—		
No. of years' observations .	13	—	—	24	25	24	25	24	25	24	32	32	27	9-10								—	16					

Observations at 0800 zone time.

* Mean of highest each year.

** Mean of lowest each year.

† Day with trace or more rain.

‡ (Max. + Min.).

Authorities:—Cairo, Survey Dept. Summary of the Weather in Egypt, etc.

Rome, R. Ufficio. Centr. Geodin. Annali.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—ANCONA. LAT. 43° 37' N., LONG. 13° 32' E. Height above Mean Sea Level, 52 feet.
METEOROLOGICAL TABLE COMPILED FROM 15-59 YEARS' OBSERVATIONS—1851 TO 1917.

MONTH	PRESSURE at Mean Sea Level		AIR TEMPERATURE								Relative humidity		RAIN		WIND								No. of days with gale	No. of days with fog			
	For month	Mean	Mean [of]				Extreme		Cloud amount, Scale 0—10	Average Fall	No. of days	Max. fall in a day	Percentage of observations, from														
			Daily Max.	Daily Min.	Highest in each month	Lowest in each month	° F.	° F.					° F.	° F.	in.	in.	N.	NE.	E.	SE.	S.	SW.			W.	NW.	Calm
January . . .	mb.	1018	° F. 42	° F. 47	° F. 38	° F. 54	° F. 31	° F. 64	° F. 24	78	6.9	in.	9	1.9	6	7	9	34	26	3	—	—					
February . . .	—	1017	45	50	40	58	33	68	24	74	6.4	1.8	8	3.1	5	7	9	24	22	3	—	—					
March . . .	—	1014	49	55	45	66	36	75	28	71	5.8	2.0	9	1.2	4	7	8	16	17	3	—	—					
April . . .	—	1013	57	63	51	70	44	77	35	67	5.7	2.2	9	1.2	4	7	9	24	14	2	—	—					
May . . .	—	1014	65	70	58	80	50	89	43	67	5.2	1.9	9	1.4	4	6	8	26	13	8	—	—					
June . . .	—	1015	73	79	66	88	58	99	48	64	4.5	1.9	7	2.0	6	7	11	24	14	8	—	—					
July . . .	—	1015	78	84	71	95	62	100	47	58	3.3	1.3	5	1.6	6	9	26	13	6	1	—	—					
August . . .	—	1015	77	83	70	92	63	102	50	60	3.3	1.6	5	1.4	6	9	26	13	6	1	—	—					
September . . .	—	1017	71	76	65	85	57	94	47	66	4.9	2.8	7	4.7	6	10	28	12	6	1	—	—					
October . . .	—	1016	62	67	58	76	46	81	36	72	6.0	3.9	10	2.5	8	6	24	13	9	1	—	—					
November . . .	—	1016	52	58	49	65	40	79	33	76	6.6	3.0	11	2.3	5	8	6	24	13	2	—	—					
December . . .	—	1017	45	50	41	58	33	66	21	77	7.0	2.4	10	1.2	5	6	2	11	9	3	—	—					
Means . . .	—	1016	60	65	54	96*	29**	—	—	69	5.5	—	—	—	5	8	6	21	12	9	2	—					
Totals . . .	—	—	—	—	—	—	—	—	—	—	—	27.3	99	—	—	—	—	—	—	—	—	—					
Extreme values . . .	—	—	—	—	—	—	—	102	21	—	—	—	—	—	—	—	—	—	—	—	—	—					
No. of years' observations . . .	59	—	44	15	15	21-22	21-22	31	40	40	21	—	—	—	—	—	—	—	—	—	—	—					

Hours of observation 0900, 1500, 2100 zone time.

* Mean of highest each year.

** Mean of lowest each year.

† Day with trace or more rain.

Authorities :—Torino, Boll. Bimens. XLI, 1922, p. 37.

Rome, R. Ufficio. Centr. Meteor. Geodin. Annali., Pt. II, etc.

METEOROLOGICAL OFFICE, AIR MINISTRY.

PLACE—VENICE. LAT. 45° 26' N., LONG. 12° 20' E. Height above Mean Sea Level, 82 feet.
METEOROLOGICAL TABLE COMPILED FROM 7-85 YEARS' OBSERVATIONS—1851 TO 1912; 1919 TO 1932; 1934.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE				Relative humidity	Cloud amount Scale 0-10	RAIN		WIND DIRECTION										Mean wind speed in knots		No. of days with gale or strong wind	No. of days with fog																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		Mean of						No. of days with fall or more	8-9 a.m.					2-3 p.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Daily Max.	Daily Min.	Highest each month.	Lowest each month.				Percentage of observations from					Percentage of observations from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
									Daily Max.	Daily Min.	Highest each month.	Lowest each month.	N. NE.	E. SE.	S. SW.	W. NW.	Calm	N. NE.	E. SE.	S. SW.	W. NW.	Calm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* Mean of highest each year.

** Mean of lowest each year.

Authorities:—Torino, Boll. Bimens. XI, 1921, p. 47.

Venice, Oss. Meteor. e Geodin., Boll. Mens., etc.

Crestani, G. La Nebbia a Venezia, Padova, Vanda, Rome, 1929.

Hours of observation 0600, 1500, 2100 zone time.

† Highest recorded temperature.

‡ Lowest recorded temperature.

§ Force 6 or over on scale 0-10.

METEOROLOGICAL OFFICE, AIR MINISTRY.

CURRENTS.—Off western coast of Greece.—A general current sets from the Archipelago along the coast of Greece towards and into the Adriatic; its strength is greatest near the coast and decreases in proportion to the distance from the land; its average rate off the Greek coast, in settled weather, may be from a half to three-quarters of a knot, but its rate is greatly increased by strong westerly and south-easterly winds, especially when the latter follow strong westerly winds which have caused an accumulation of water in the eastern part of the Mediterranean. It is also at times much stronger through the channels inside the Ionian islands.

There is, however, sometimes a southerly surface current in Corfu strait which is retarded or increased according to the force and direction of the winds in the offing. When it blows rather strongly from northward the waters are south-going at rates of from $1\frac{1}{2}$ to 2 knots, and a fall of from 3 to 4 feet (0^m9 to 1^m2) is occasioned. A southerly wind causes a rise of about the same amount, and the current then is north-going. This is not, however, confined to the channel, although it is there most marked, for over the whole Ionian sea southerly winds cause a rise of about a foot (0^m3), and northerly winds a fall of about the same amount; if the winds are strong and continuous, the corresponding elevation or depression is greater.

Adriatic.—Three kinds of currents have been observed in the Adriatic, namely, a regular inshore current, a tidal stream with periodic variations, and a current produced by the action of the winds.

The influence of the rivers which flow into the Adriatic makes itself felt to a certain extent after the period of heaviest rain, but it is always local.

The general effect of the current along the coast of Greece and among the Ionian islands is to produce a regular inshore north-west-going current through Corfu strait along the eastern shore of the Adriatic round the Gulf of Venice, and from thence more rapidly south-east-going along the western shore of the Adriatic. Its approximate breadth is from 20 to 30 miles along the eastern shore, about 10 miles in the northern part of the western shore, and about 6 miles in its southern part.

The rate of this current is very irregular, varying in calm weather according to locality and season; it is least in summer, when there is scarcely any current on the Venetian or Italian coasts as far southward as Fiume Tronto (*Lat.* $42^{\circ} 53' N.$, *Long.* $13^{\circ} 55' E.$), where, however, it begins to increase in strength and at times runs at a rate of 3 knots, its greatest rate being within 3 miles of the coast.

Its rate in the Adriatic is greatly influenced by its strength through Corfu strait, where, as well as between the Ionian islands, the stream is remarkably affected by the wind, but is generally north-going. Between Corfu and Cape Linguetta, its average rate is about half a knot, increasing perceptibly as that cape is neared, especially if the wind should be south-easterly.

The rate of the north-west-going current under ordinary conditions is three-tenths of a knot in the southern and half a knot in the northern part.

Off Otok Mljet and Isola Lagosta, a branch of the north-west-going current sets in the direction of Isole Pelagosa and Testa del Gargano, where it unites with the south-easterly current along the western shore, which it considerably increases in strength. Another rather

Charts 1800, 1440, 2158a, 2158b.

weaker branch turns off opposite Il Quarnaro, and also flows towards the western shore, where it unites with the south-east-going stream.

From the great influence of the slightest change of wind on the currents of the Adriatic, it is supposed that they do not extend to any great depth; and, according to some observations, the motion of the stream does not extend vertically beyond a depth of 4 or 5 fathoms (7^m3 or 9^m1), whilst by other observations, it appears to extend to a depth of 11 fathoms (20^m1).

See Surface Current Tracks, page 39.

The general drift of the current in the Adriatic is accompanied by a sufficient tidal influence to cause a variety of local sets called "ligazzi," some of which prevail right across the sea, a natural consequence of the outline of the Adriatic and its numerous islands.

The inshore current cannot be directly observed along the greater part of the eastern shore, because, under the influence of the tides, it alternates between a north-west-going and south-east-going direction, and is not noticeable except by the extent to which vessels feel its influence during a rising and falling tide.

The tidal streams, under ordinary conditions, alternate regularly twice in the day. These streams are hardly felt in the southern portion of the Adriatic, but towards the northern part they increase with the rise of the tide, and attain a rate of half a knot. From the above it is obvious that a flood tidal stream coming from southward strengthens the north-west-going current, and weakens the south-east-going current on the eastern shore. Inversely, an ebb tidal stream weakens the north-west-going current and strengthens the south-east-going. Under ordinary conditions, therefore, there are two currents on the eastern shore, the stronger going north-westward, alternated by a weaker going south-eastward, both of which might at first sight be mistaken for tidal streams since they change with the tide, but which are in reality the result of the combined action of the inshore current and tidal streams. The south-east-going current of the eastern shore does not usually alter its direction, and the winds do no more than alter its rate.

The secondary current, which flows from Isola Lagosta (Lat. 42° 45' N., Long. 16° 53' E.) towards Testa del Gargano, has a variable rate of from one to 1½ knots, and this current does not appear to be varied in its direction by the action of either tide or wind.

The currents produced by strong and persistent winds can influence the inshore currents and tidal streams so as to interfere with the regular change on the eastern shore and to reverse the south-east-going stream on the western shore. Strong winds blowing in the direction of the currents greatly increase their velocity, the greatest rate being attained on the eastern shore with south-easterly winds and a rising tide, and on the western with a strong north-westerly wind and a falling tide. Under these circumstances the current will attain a rate of 3 knots.

On the eastern shore, ships may be driven from 7 to 12 miles north-westward during a day under ordinary conditions and from 24 to 30 miles in a day during persistent south-easterly winds.

Entrance.—The currents are very variable and frequently strong towards the middle of the entrance, where in fresh northerly breezes they are between west-north-west-going and west-south-west-going, at a rate of from three-quarters to one knot. Along the western shore,

between Capo d' Otranto and Capo Santa Maria di Leuca, the current is generally strong except in calm weather and during the fine season, when the wind blows directly on this coast. In a calm, at a distance of 6 miles offshore, the current is south-going at a rate of one knot, and near Capo Santa Maria di Leuca has a rate of more than 2 knots. In fresh north-westerly winds, it soon attains rates of 2, 3, and even 4 knots.

A west-going current at the entrance of the Adriatic may be considered almost constant; at times, however, under the influence of westerly and south-westerly winds, along the Ionian islands and as far as Cape Linguetta there is an east-going set of about a knot and even more, between the islets north-westward of Corfu, where, in December, it has been found north-north-east-going at a rate of 2 knots, with a smooth sea and a light south-westerly wind.

Eastern shore.—From the island of Sazan the stream appears to divide into two parts, the inshore branch being north-going as far as Pell i Drinit with an irregular and often scarcely perceptible rate, but which, at times with south-easterly winds, amounts to one or $1\frac{1}{2}$ knots. This current follows the coast as far as Kep i Rodonit, its greatest velocity being near the headlands, but in the bays it appears to be diffused. Beyond the Pell i Drinit it again follows the direction of the coast.

The other branch, from the island of Sazan (*Lat. 40° 30' N., Long. 19° 16' E.*), runs generally in the direction of Otok Mljet, at a rate varying in calm weather from a half to 2 knots. When influenced by south-westerly winds, and even in calms, this current frequently is north-east-going at a rate of about three-quarters of a knot. Between Cape Linguetta and Otok Mljet a south-going current is rarely found; this is only met with westward of this line, and it increases in force as the coast of Italy is approached, especially with a northerly breeze.

Off Boka Kotorska the inshore current of the Albanian coast is deflected by an outset caused by south-easterly winds, which drive the water towards the coast; the two streams here produce eddies which should not be overlooked.

Beyond the entrance to Boka Kotorska (*Lat. 42° 25' N., Long. 18° 33' E.*), the general current resumes its course, and, off Dubrovnik, being obstructed by the numerous islands northward, it is chiefly west-going or west-north-west-going.

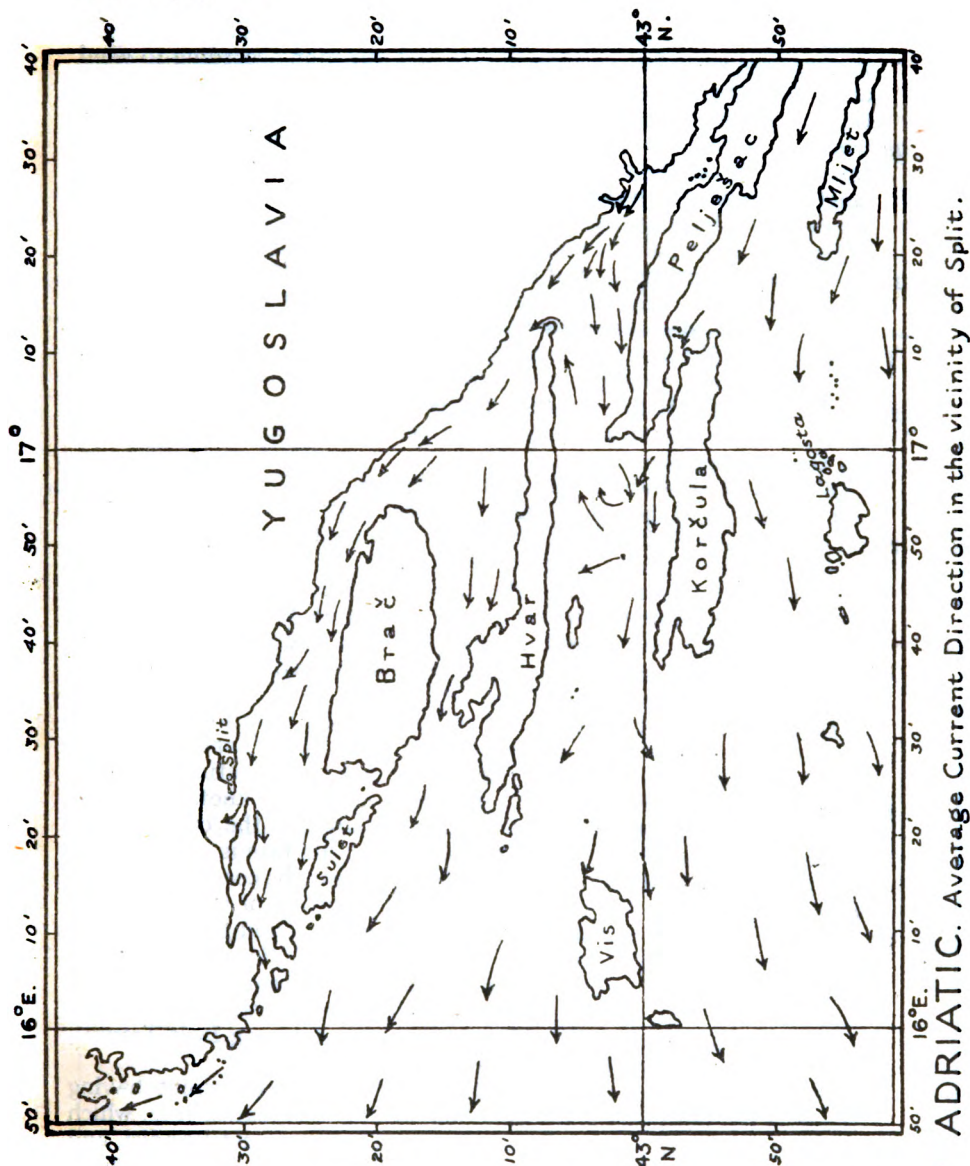
Among the islands, the stream is generally west-going, in the direction of their length, and is more regular in the larger channels than in the others. The rate varies according to the wind and state of the tide, which latter is felt considerably among the islands and on the coast abreast them; with south-easterly winds it sometimes attains a rate of $3\frac{1}{2}$ or 4 knots, especially at the eastern entrances of the channels. In the narrow channels it is more rapid and variable.

Outside the islands there is a regular west-going current, but on closing them it becomes uncertain. About Otok Vis, the current is nearly always west-going; with continuous south-easterly winds its rate is considerable, particularly towards the western part of the island, whence it strikes off in a north-west-going direction, causing an eddy which renders this passage somewhat dangerous. The west-going current, in this part of the Adriatic, is accelerated by the outset from the channels of the various islands. In light winds and calms, there is a west-going current at a rate of about three-quarters of a knot between

Charts 1440, 2158a, 2158b.

Isole Pelagosa and Otočić Svetac, but with fresh north-westerly winds, its force proportionately decreases.

See diagram of Current Direction, below, and Surface Current Tracks, page 39.



Near Otočić Svetac and Isole Pelagosa the current, especially in winter, has no regular direction, but produces somewhat dangerous eddies; under the influence of a strong Bora in Il Quarnaro, it is then frequently south-going or south-south-west-going, turning more westward as it progresses southward. Well out in the offing at such times,

Charts 1440, 2158a, 2158b.

near Otočić Jabuka, and between Otok Vis and Otok Premuda, very irregular streams prevail; the neighbourhood of these islands should, therefore, be avoided. After passing Otok Vis and Otočić Svetac, the current apparently takes its former direction parallel with the islands
 5 and coast.

In Il Quarnaro, and in the channels of the Yugoslav coast, the currents are irregular, varying in rate and direction according to wind and tide; they are also influenced by the rivers and numerous islands. Gales from the offing throw a large body of water into these channels,
 10 where it is pent up until the wind abates and then runs back with rapidity; if, on the contrary, the winds are from northward for any length of time, the water is driven into the offing and as soon as the wind moderates returns with force.

Between Capo Salvore and Trieste (*Lat. 45° 39' N., Long. 13° 45' E.*)
 15 the current is east-going and is always felt at the latter place, where it sweeps round the bay, on its course to the Venetian coast, at a rate of about a knot, decreasing in the offing.

At a short distance off the coast of Istria, the motion of the waters is in general south-west-going or towards the Venetian coast, and is
 20 tolerably regular in fine weather, but is greatly influenced by wind and tide. This irregularity is much more perceptible on the eastern than on the western shore.

Western shore.—From the delta of Fiume Po, the streams spread out eastward and then bend southward and south-eastward; in spring,
 25 on the melting of the snow, and after abundant autumnal rains, the actions of the freshets is most perceptible.

From Punta della Maestra the current of the western shore of the Adriatic is generally south-east-going. As far as Ancona, it is subject to the deflection caused by the outset from the numerous streams and
 30 rivers; its rate is never considerable, seldom exceeding one knot even after the great freshets of Fiume Po.

In the vicinity of Ancona, and principally southward of that port, the current, deflected by the projection from Monte Conero, is east-going, frequently at a rate of one knot; but, with continuous winds
 35 from between N.W. and N.E., the rate exceeds 2 knots.

Between Monte Conero and Testa del Gargano, the current continues its course following the Abruzzi coast; its rate is estimated at one knot in fine weather, but it is more rapid near the coast of Promontore del Gargano. Here the coast causes a portion of the current to
 40 become east-going, whilst the other part sweeps round the head close along the coast and flows across the entrance of Golfo di Manfredonia without entering it. The east-going branch flows towards Isole Pianosa and Pelagosa, and, meeting the west-going current already mentioned, see page 36, produces rapid eddies. Around and among Isole Tremiti,
 45 the east-going current is of great strength.

From Testa del Gargano to Otranto, the inshore current having resumed its south-east-going direction, attains its greatest rate, which is estimated at $1\frac{1}{2}$ knots between Testa del Gargano and Brindisi, and nearly $1\frac{1}{2}$ knots between the latter and Otranto; with northerly
 50 winds, this rate rapidly increases and sometimes exceeds 3 knots. It is generally weak in summer, especially with onshore winds, but with north-westerly winds its strength is sufficient to require caution.

After passing Capo d' Otranto, the current follows the trend of the

Charts 1440, 2158a, 2158b.

coast southward and flows close round Capo Santa Maria di Leuca into the Mediterranean.

The offshore currents on the Italian coast are variable in strength and direction according to prevailing winds. The Bora drives the water towards the Italian, and south-westerly winds towards the Yugoslav coast; whilst south-easterly winds cause an irregular curve on either side. After a strong wind has lasted two or three days a current contrary to that previously running will always be found as soon as the wind abates and will continue until the former has resumed its usual course.

About midway between Capo Promontore and Monte Conero the current varies between south-west-going and south-east-going at rates of from a quarter to half a knot. There is little or no current during the fine season.



Charts 1440, 2158a, 2158b.

TIDES AND TIDAL STREAMS.—Amongst the Ionian islands, and on the coast of Pelopónnisos, the tidal action is quite unimportant, except at the entrance to the Gulfs of Amvrakia (Arta) and Corinth (*Lat.* $38^{\circ} 19' N.$, *Long.* $21^{\circ} 47' E.$), where both flood and ebb tidal
5 streams at times attain a rate of 3 knots.

The tides are scarcely perceptible at the mouth of the Adriatic; they are first felt at Kotor on the eastern and at Brindisi on the western shore, becoming stronger towards the northern part of the gulf.

On the coast of Yugoslavia the range of the tide is small and sea
10 level is considerably affected by meteorological conditions.

In strong south-easterly winds there is sometimes a rise of from one foot (0^m3) to nearly 2 feet (0^m6), and in the channels and narrow passages between the islands a strong current of short duration is produced.

15 On the western shore the rise varies from one foot (0^m3) to nearly 4 feet (1^m2) at springs, and according to local circumstances and prevailing winds; ; at Bari and Brindisi the range of the tide at springs is one foot (0^m3). Bora gales cause a rise along the coast of Italy.

At Venice, with a heavy south-easterly gale, the sea sometimes
20 rises 6 feet (1^m8) above the general level; ; northerly winds cause a fall sufficient to uncover the mud of the lagoon. There is a rise and fall of 3 feet (0^m9) at springs.

NAVIGATION OF THE ADRIATIC.—These remarks apply chiefly to small vessels, as steamships will, in most cases, take the
25 direct route.

In the navigation of the Adriatic, local knowledge and experience are of great value. In winter the chief difficulties arise from the frequency of thick fogs and boisterous winds, from the narrowness of the sea, and, on the western shore, from the want of shelter in
30 bad weather. As a general rule, the eastern side is to be preferred, both in passing up and down the Adriatic, notwithstanding the disadvantage of adverse currents in the latter case. The eastern shore affords protection, especially from the Bora.

In a small vessel the greatest possible vigilance is necessary to
35 avoid being caught unprepared by a Bora, and at the slightest premonitory symptom, *see* page 11, no time should be lost in seeking the nearest place of refuge, as the violence of the gale may drive a vessel westward and reduce her to the necessity of anchoring on the open Italian coast, with bad holding ground, unless she can reach the
40 anchorage at Isole Tremiti (*Lat.* $42^{\circ} 07' N.$, *Long.* $15^{\circ} 30' E.$) or that in Golfo di Manfredonia.

The navigator should be on his guard also against the Scirocco which is dangerous in some parts of the Adriatic; but, as it generally gives ample warning and invariably comes on gradually, there is
45 usually sufficient time to seek shelter under the islands.

Chart 1800.

Making the land.—It is customary for vessels bound to the Adriatic to endeavour to make Corfu island, which, being high, is visible from a considerable distance. Approaching from the westward, the moun-
50 tains of Greece are first seen, then Corfu and its islands, forming a long chain of small regular hills. The monastery crowning Mount Pandokrátor (St. Salvador), at the northern part of Corfu, is a good mark.

Charts 1800, 1440, 2158a, 2158b.

Chart 1800.

This island may be boldly approached and a course steered westward of Othonoi (Fano) island for Cape Linguetta, the eastern point of entrance to the Adriatic. Sometimes Capo Santa Maria di Leuca is sighted, but occasionally the landfall is farther westward on the Italian coast. 5

In making the land with south-easterly winds, which usually bring thick weather, it is difficult to distinguish the coast of Italy even at a short distance; it is then best not to make the land westward of Capo Santa Maria di Leuca, as the shore could not be closed on account 10 of Secche di Ugento, the foul ground westward of Torre I Pali (Mediterranean Pilot, Vol. II.). If the Italian coast is sighted, every effort should afterwards be made to close Cape Linguetta and the Albanian coast, especially in the bad weather season.

The chances of favourable and unfavourable winds on entering the 15 Adriatic depend on the time of year; thus, in the autumn and winter, southerly, south-easterly, and easterly winds prevail; in summer the most common winds are north-easterly and northerly; the latter last a considerable time, but are never strong for more than three days. 20

On making the land with winds between S.E. and S.W., a course should be steered to pass about 12 miles from Capo d'Otranto. In the winter, with strong winds, a heavy sea and rain are almost continuous at the entrance of the Adriatic; nevertheless, there should be no hesitation in proceeding, after having verified the vessel's position, 25 as shelter may be easily found if it should become necessary.

With contrary winds the Albanian coast should be closed to take advantage of the north-westerly current. For a similar reason the Italian coast, between Capo Santa Maria di Leuca and Capo d'Otranto, should then be avoided as much as possible, for with such winds the 30 south-east-going current is always rapid there.

At the entrance to the Adriatic, in the fine season, north-westerly winds are often rather fresh during the day, and vessels, if unable to beat against the current which constantly sets out near the middle, can proceed to the anchorage off Porto di Castro. 35

Chart 1440.

When proceeding to Pellg i Drinit, Kotor, Dubrovnik (*Lat.* 42° 38' N., *Long.* 18° 07' E.), etc.; after passing Cape Linguetta, no remarkable point presents itself along the generally low sandy coast of Albania, except Kep i Lagit (Laghi), the high land immediately north- 40 ward of Durrës, and that of Kep i Rodonit; care should therefore be taken to keep a good offing. Between Cape Linguetta and Durrës the current is north-west-going at a rate of about a knot, and north-east-going when about abreast of Durrës.

If overtaken by a heavy gale from the southward or south-west- 45 ward, which is sometimes attended with danger on this part of the eastern coast, shelter may be sought in Gji i Vlonës or Gji i Durrësit. The first of these is the easier of access under all circumstances; it is sometimes imprudent to run for Gji i Durrësit in a southerly gale, as the adjoining land is low and not easily distinguished in thick weather. 50 If unable to fetch Gji i Vlonës, it is advisable to make for Rodoni roads, where there is good shelter eastward of the cape. In Bar roads, shelter may be found on the northern side of Rt Volovica, which forms their south-western extremity.

Charts 2158a, 2158b.

Chart 1440.

The most dangerous winds between Cape Linguetta and Kotor are, the Bora, which blows from between N.E. and E.N.E.; south-westerly winds, which blow right onshore; and, with reference to making the land, south-easterly winds, which are usually accompanied by thick weather.

When between Cape Linguetta and Kotor, if the warnings of an approaching Bora gale, as described in the preceding pages, should be perceived, a small vessel should seek shelter under the Albanian coast in the indentation of the coast between Bar and Rt Mendra, or along the coast between the latter and Shëngjin, or, finally, in Gji i Lalzës (Lales), south-eastward of Kep i Rodonit. If far enough northward and sufficiently near the coast, with the Bora not too violent, a vessel of light draught might reach shelter in the harbour of Molunat or in Zaliv Traste; or, if of considerable draught, in the Koločepski kanal. Lastly, if too far southward to reach either of these places, she should endeavour to fetch the anchorage at Otok Mljet. In all cases, great caution must be used in navigating the Yugoslav coast.

20 Route northward.—When proceeding to any of the northern ports, and having arrived off Cape Linguetta, a course should be steered for Isola Lagosta, on the southern extremity of which island is a powerful light, which is a good point of departure. Having passed Isola Lagosta, a course should be shaped for Isola Cazza, also well lighted, and from thence to pass southward of Otok Biševo, or between it and Otok Vis; in the latter case, guard against the current which there is strongly west-going. The islands off Rt Ploča are frequently obscured by mist during south-easterly or south-westerly winds.

This is the safest and most prudent route at all seasons; but vessels bound to Ancona in summer at times sight Isola Pelagosa (*Lat. 42° 23' N., Long. 16° 15' E.*), which stands up like a column and shows from its summit a powerful light, which, in clear weather, can scarcely be passed without being seen. Following this course, it is better to pass between Isole Pelagosa and Lagosta rather than between the former and Promontorio del Gargano; for, although at this time of the year the currents are usually weak, when southward of Isole Pelagosa, and after heavy rains, they may be found strong.

After reaching Otok Vis, vessels bound to Trieste or Venice usually shape a course to pass southward of Otok Kornat, Dugi otok, etc.; sighting the light on Rt Veli rat, the north-western extremity of Dugi otok, and from thence continuing for Capo Promontore.

Between Otok Vis and Capo Promontore, it is well to keep rather close to the islands in order to profit by the ordinary north-west-going current, and to keep in a position to reach one of the numerous sheltered localities in the event of a Bora gale rising. Among these the chief are:—Viska luka, on the northern side of Otok Vis; Luka Telašćica (Tajer), the open anchorage on the south-western side of Dugi otok, where a vessel may ride out a heavy gale; the open anchorage under Otok Premuda; Porto Lussinpiccolo; Porto San Pietro dei Nembi, for small vessels; and the excellent anchorage of Canale di Unie, which has sufficient space for a fleet.

When abreast of Il Quarnaro, be as near as possible to its entrance so as to be in a position to make at once for an anchorage on the occurrence of a Bora. With the wind between S.E. and S.W., a heavy

Charts 2158a, 2158b.

Chart 1440.

sea sets on the coasts of the islands between Rt Ploča and Capo Promontore, and, as the wind frequently lulls towards evening, the appearance of the weather should be carefully watched so as not to be caught too close to the shore. Besides other warning symptoms, gales from the southern quarter are preceded by a long swell from the south-eastward; in the winter season, this swell continues some time after a south-easterly wind has been succeeded by a Bora gale. 5

The most remarkable object first seen after passing Dugi otok is Monte Ossero, at the northern end of Isola Lussino. When farther northward, the forked summit of Monte Maggiore, the highest mountain of Istria, is seen. During sea breezes, especially from the south-eastward, or when they may be expected, the summits of the two mountains are always clouded; during land winds, and at the cessation of sea winds, they suddenly become clear. 10 15

Chart 201.

Route to Trieste.—After passing Capo Promontore (*Lat. 44° 46' N., Long. 13° 55' E.*), the coast of Istria should be kept aboard, especially with contrary winds; the vessel is then in a better position for anchoring, if necessary, and the current sets northward when within a short distance of the land. Generally speaking, the weather becomes finer and the water smoother when northward of, or on nearing, Porto di Rovigno. Having passed Porto di Rovigno, a course should be steered for rounding Capo Salvore; from thence the whole Golfo di Trieste is open, and a course may be shaped for Porto di Trieste. 20 25

When northward of Capo Promontore south-easterly winds frequently veer southward; occasionally, and especially in winter, they become more easterly, in which case a Bora may be expected. The high lands of Istria should be watched, and when they begin to be clouded a place of shelter should be sought before the land becomes entirely concealed. 30

Between Fiume Timavo and Porto Grado it is not safe for a vessel of moderate size to stand into a less depth than $5\frac{1}{2}$ fathoms (10^m), within which the depths decrease rather suddenly. 35

South-westerly and south-easterly winds, which blow dead upon the Venetian coast, are dangerous. If overtaken by a heavy Bora northward of Capo Salvore, and unable to reach Pirano anchorage, it is best to bear up for Porto di Umago, which is well protected by Capo Salvore. It is not safe under such circumstances to anchor off the open coast between Capo Salvore and Porto di Trieste. 40

When between Capo Salvore and Capo Promontore a vessel, unable from the violence of the gale to hold her own, may anchor anywhere within about 6 miles of the coast of Istria; outside of this there is a heavy sea in bad weather, but in case of emergency she may, without great danger, anchor as far as 18 miles from the coast between Porto di Rovigno and Capo Salvore, in depths of 16 to 18 fathoms (29^m 3 to 32^m 9); this is preferable to the risk of being driven on the coast of Italy. 45

On entering the Gulf of Venice at night, if a south-westerly gale should arise, it is advisable to keep an offing until daylight. 50

SIGNALS.—Storm signals.—The following storm signals are in use on the coast of Italy:—

Chart 1440.

Day signal.	Night signal.	Signification.
A cone, point upwards	Two <i>red</i> lights disposed vertically.	Strong wind or gale probable, commencing from north-westward.
Two cones, vertical, points upwards.	A <i>red</i> light over a <i>white</i> light.	Strong wind or gale probable, commencing from north-eastward.
Two cones, vertical, points downwards.	A <i>white</i> light over a <i>red</i> light.	Strong wind or gale probable, commencing from south-eastward.
A cone, point downwards.	Two <i>white</i> lights disposed vertically.	Strong wind or gale probable, commencing from south-westward.
Two cones, vertical, bases together.	One <i>red</i> light.	Strong wind or gale probable, direction of wind uncertain.

Signals of distress.—The following signals of distress are made from certain Italian lighthouses and light-vessels :—

- (1) A black flag with a white ball in centre by day or a *white* flare by night . . . Doctor needed.
- 5 (2) A black and white chequered pendant by day or a *red* followed by a *white* flare by night . . . Apparatus. damaged.
- (3) A black ball by day or a *red* flare by night . . . Water and provisions required.
- 10 (4) A black flag with a white ball in centre above a black ball by day or a *white* followed by a *red* flare by night . . . Shipwreck.
- 15 (5) A black ball above a black flag with a white ball in centre by day or a *white* followed by a *red* and then by a *white* flare by night . . . Aircraft accident.

In the case of light-vessels a *yellow* flare is substituted for the white. These night signals are repeated every ten minutes until answered.

- 20 The following signals are made from Yugoslav lighthouses if the keepers are in urgent need of help :—

By day a rectangular white sheet with a spherical object either above or below it will be displayed, and smoke will be made from two positions at a distance of 164 feet (50^m0) apart.

- 25 *By night* fireworks, emitting *white* and coloured sparks, will be discharged.

A vessel observing these signals should afford all possible assistance.

- Aircraft distress signals.**—Any aircraft in grave or imminent danger and requiring immediate assistance, will make or display one or more of the following signals :—

- 30 1. The International distress signal S O S by radiotelegraphy, as prescribed in the Admiralty List of Radio Signals.
2. The spoken word "Mayday" by radiotelephony.
- 35 3. The International distress signal S O S by visual signalling or any sound apparatus.
4. The International Code flag signal NC.
5. The International Code distance signal, consisting of a square flag having above or below it a ball or anything resembling a ball.
- 40 6. A continuous sounding of any sound apparatus.
7. A succession of *red* pyrotechnic lights fired at short intervals, or a *red* flare from which, at intervals of about *three seconds*, a *red* light is ejected.

Urgent signals from aircraft.—An aircraft, having a very urgent message to communicate to a vessel, concerning the safety of any aircraft, vessel or person, within range of assistance, will fly low around the vessel, firing a succession of *green* pyrotechnic lights, or will flash a succession of *green* flashes with the daylight signalling apparatus. 5
The aircraft will, then, signal the message as prescribed in the International Code of Signals; or alight alongside the vessel; or, if unable to signal or alight, will fly towards the aircraft, vessel or person in distress. When the *green* pyrotechnic lights are seen by the vessel, a boat is to be prepared for lowering. 10

The signals from the aircraft are to be acknowledged by the vessel by flashing the answering sign, whether by day or at night, with the daylight signalling apparatus; if no such apparatus be carried, the answering pendant is to be hoisted close up, by day, and, at night, a *white* light is to be waved, in a position away from other sources 15 of light.

If an aircraft is in difficulties which compel her to land, but is not in need of immediate assistance, she will fire a succession of *white* pyrotechnic lights or, at night, if not in possession of pyrotechnic lights, she will make a succession of short flashes with her navigation lights. 20

Non-urgent signals from aircraft.—An aircraft wishing to communicate with a vessel on a matter of no urgency, will fly around the vessel to attract attention. 25

Signals to denote the presence of submarine vessels.—*Great Britain.*—British vessels fly a rectangular red flag to denote that friendly submarines, which may be submerged, are in the vicinity. 25
Vessels are cautioned to steer so as to give a wide berth to any vessel flying such a flag. If from any cause it is necessary to approach her, vessels should proceed at slow speed until warning is given of the danger zone by flags, semaphore or megaphone. 30

Greece.—A vessel or a shore station may call the attention of vessels to the presence of submarines by the following methods:—

(a) HP flags of the International Code of Signals.

(b) wireless.

(c) blasts on the siren. 35

(d) firing a blank charge.

A submarine wishing to communicate with the surface releases a buoy painted in red and white vertical stripes and furnished with a telephone. A vessel sighting such a buoy immobile should immediately send a boat to ascertain, by using the telephone, if the submarine needs assistance; if this is so, she should communicate at once with the nearest authorities. 40

Greek vessels accompanying submarines display either two large pendants, two large pendants over a large square flag, or, two large balls. 45

Italy and Yugoslavia.—When Italian and Yugoslav submarine vessels are carrying out exercises in the areas reserved for them, the signal stations in sight and the vessels escorting the submarine vessels will display, during the exercises, the flags HP of the International Code of Signals. 50

Whenever the signal stations display the signal HP, all vessels are recommended to exercise the utmost vigilance when passing through the areas indicated, and, if possible, avoid them.

For areas in which submarines exercise, *see* body of book.

Vessels inconvenienced by searchlights.—In the event of the navigation of a vessel being inconvenienced by the glare from search- 55

lights near a port in the British Empire, she should make the International code signal ZO (— . . — — —) by lamp and by whistle, siren or fog horn.

Both the light and sound signals should be employed, whenever possible, and should be repeated until the inconvenience is removed.

Only real urgency should necessitate the use of this signal, as unless the vessel is actually in the rays of the searchlight, it is not possible for the operator to know which projector is affected.

The signal is designed to assist mariners ; no liability whatever will be admitted.

This signal should also be used in similar circumstances near ports in other countries.

Signal stations.—On the Italian coasts, signal stations are generally (but not always) painted in black and white chequers. Vessels can communicate with them by means of the International Code of Signals.

COMMUNICATIONS.—The towns and most of the coastal villages mentioned in this volume have post and telegraph offices and are generally connected to the general telephone system.

For rail and steamer communication, *see* under the various ports.

Radio stations.—Coastal radio stations in the area covered by this volume, which are open for public correspondence, are established at :—

Greece.—Corfu (Kerkyra in International list), Corinth.

Yugoslavia.—Klinci, Šibenik, Zadar (Zara in International list).

Italy.—Brindisi, Ancona, Fiume, Venice.

For details, *see* List published by the Bureau of the International Telecommunication Union.

For details of radio stations in or near the area covered by this volume, which transmit weather bulletins, storm signals, navigational warnings, time signals, &c., *see* Admiralty List of Radio Signals.

FIRING DANGER AREAS.—Firing and bombing practices take place in a great number of areas off the coasts of Great Britain, Northern Ireland and Eire, and a number of areas in the waters of Commonwealth, Dominion, Colonial and Foreign governments.

In view of the responsibility of range authorities for avoiding accidents, limits of practice areas will not be shown on charts and descriptions of areas will not appear in Sailing Directions. Such range beacons, lights, marking buoys or targets as may be of assistance to the mariner will, however, be shown on charts and, when appropriate, mentioned in the appropriate volumes of Sailing Directions. Lights will be mentioned in the Admiralty Lists of Lights.

The principal types of practices carried out are :—

(a) *Bombing practice from aircraft.*

Warning signals are usually shown.

(b) *Air to air, and air to sea or ground firing.*

The former is carried out by aircraft at a large white or red sleeve or flag towed by another aircraft moving on a steady course. The latter is carried out from aircraft at towed or stationary targets on sea or land.

As a general rule, warning signals are shown when the targets are stationary, but not when towed targets are used.

Charts 1800, 1440, 2158a 2158b.

(c) Anti-aircraft firing.

This may be from anti-aircraft guns or machine guns at a target towed by aircraft as in (b) above, or at balloons or kites. Practice may take place from shore batteries or ships.

Warning signals are, as a rule, shown from shore batteries but not from ships.

(d) Firing from shore batteries or ships at sea at fixed or floating targets.

Warning signals usually shown as in (c).

Warning signals, when given, usually consist of red flags by day and red fixed or red flashing lights at night. The absence of any such signal cannot, however, be accepted as evidence that a practice area does not exist. Warning signals are shown from shortly before practice commences until it ceases.

Aircraft are also sometimes used to warn shipping of their proximity to a danger area where practice is in progress. The method adopted, known as "buzzing," consists of low flying by the aircraft with repeated opening and closing of the engine throttle.

Caution.—A vessel may be aware of the existence of a practice area from Local Notices to Mariners or similar method of promulgation and by observing the warning signals or the practice.

A vessel should, whenever possible, avoid passing through an area in which a practice is in progress, but if compelled to do so should endeavour to clear it at the earliest possible moment.

If during anti-aircraft, air to air, sea or ground firing practice, projectiles or splinters are observed to be falling near a vessel, she should maintain her course and speed and all persons on board should take cover. Every practicable precaution, however, will be taken by the Authority in charge of the practice to avoid the risk of damage from falling shell splinters, bullets, &c., to vessels and all on board them within the area.

STANDARD TIME.—The standard time kept in Greece is that of the meridian of 30° E., or 2 hours fast on Greenwich mean time.

The time kept in Italy and Yugoslavia is that of the meridian of 15° E., or one hour fast on Greenwich.

When summer time is kept, the time in Greece is 3 hours fast, and the time in Italy is 2 hours fast on Greenwich mean time.

MEASURED DISTANCES.—There are measured distances off Boka Kotorska, Otok Šolta, and Capo Promontore; for details, see body of book.

UNIFORM SYSTEMS OF BUOYAGE.—**Italy.**—The Italian Government has directed that all buoys, beacons, and seamarks on the coasts of the kingdom shall be painted according to the rule adopted by the Congress of St. Petersburg; buoys to be left on the port hand entering a port or channel will therefore be painted red, and those to be left on the starboard hand, entering, will be painted black.

Yugoslavia.—A system of marking has been adopted based on a combination of colour and shape; channels or fairways bounded by shallow water on both sides will be marked by red spar buoys on the starboard hand, and black conical buoys on the port hand, entering from seaward.

Beacons on the starboard hand entering will be painted red, and

Charts 1800, 1440, 2158a, 2158b.

those on the port hand, black; where necessary, for the purpose of better distinction, beacons on the starboard hand will be surmounted by a cone, and beacons on the port hand by a cylinder.

Marks at seaward entrances to fairways will, if they have not already been made noticeable by conspicuous piles, light-buoys, &c., be surmounted by spherical cages.

Small shoals outside fairways will be marked by perches, some of which will be surmounted by spherical cages, or by spar buoys, surmounted by spherical cages.

10 Large shoals outside fairways will be marked by spar buoys or beacons surmounted thus:—In the middle of the shoal by a cylinder, placed vertically; on the northern side of the shoal by two triangles, points upwards; on the southern side of the shoal by two triangles, points downwards; on the eastern side of the shoal by two
15 triangles, the upper one point upwards, and the lower one point downwards; and on the western side of the shoal by two triangles, the points of which are towards each other.

COAL AND FUEL OIL.—Coal can be obtained at Ancona, Bari, Brindisi, Corfu, Fiume, Gruž, Kotor, Patras, Pola, Trieste and Venice.

20 Fuel oil can be obtained at Ancona, Brindisi, Gruž, Kotor, Monopoli, Patras, Pola, Trieste, Venice.

For details *see* under the various ports.

CONSULAR OFFICERS.—**Greece.**—Besides the British Envoy Extraordinary and Minister Plenipotentiary, who resides in Athens,
25 British Consular officers are stationed at Corfu, Patras and Zante.

Yugoslavia.—Besides the British Envoy Extraordinary and Minister Plenipotentiary, who resides in Beograd (Belgrade), British Consular officers are stationed at Gruž, Split, Sušak and Vis.

Italy.—Besides the British Ambassador Extraordinary and Plenipotentiary, who resides in Rome, British Consular officers are stationed
30 at Ancona, Bari, Brindisi, Fiume, Trieste and Venice.

PILOTAGE.—**Greece.**—Pilotage is compulsory for all foreign merchant vessels, also for foreign men-of-war other than light craft, for most of the harbours in Greece and in the archipelago. *See* under
35 various ports.

Caution.—Mariners are warned that passage is restricted, and a control of navigation is exercised by the Greek Naval authorities, in the areas within Hellenic territorial waters. These areas extend to a distance of one mile from the shore outside enclosed waters and
40 their approaches.

Italy.—Pilot boats are painted black with a white stripe, and the word "Pilota" in white on bows and stern, with, in the case of a sailing boat, the letter "P" on each sail, and in a steamer on each side of her funnel. They also carry, in day time, a square flag—blue, white, blue,
45 vertical stripes, the white stripe in the centre having on it the letter P in blue.

Vessels requiring pilots by day should either

- (a) Hoist the national flag on a white ground.
- (b) Make the international code signal PT.
- 50 (c) Hoist the international code flag G.

And by night

- (a) Burn a *blue* light.
- (b) Show a *white* light occulted at short intervals.

Pilots are forbidden to take vessels in tow.

A pilot boat approaching a vessel with the intention of piloting her shall convey such intention by day, by dipping the distinguishing flag several times; by night, by showing a *flashing* light at short intervals.

5

DREDGERS.—Yugoslavia.—Dredgers and other craft engaged in works in harbours, or in much-frequented waters, on the coasts of Yugoslavia, where liable to be affected by the wash of passing steam vessels, carry the International code signal signifying "Reduce speed" and all steam vessels in the vicinity must reduce their speed, so as to avoid damage or disturbance of the work. Infringements of this order are punishable with fines or arrest and payment of any damage occasioned.

TUNNY FISHERIES.—Tunny fisheries on the coasts of Italy are marked thus:—

15

1. *Tunny fisheries proper:*

(a) The point at which the nets are attached to the shore is marked by a mast not less than 33 feet (10^m1) in height, surmounted by a disc 6 feet (1^m8) in diameter, painted in concentric white and black bands, and exhibiting at night two *white fixed* lights, 6 feet (1^m8) apart, and visible from a distance of 3 miles.

(b) The outer left hand extremity of the nets as seen by an observer situated at the point at which the nets are attached to the shore is marked by a buoy, boat, or floating mark, surmounted by a spar 16 feet (4^m9) in height, carrying by day two black balls placed vertically 6 feet (1^m8) apart, and by night two *fixed* lights, placed vertically, 6 feet (1^m8) apart, the upper *green*, the lower *white*, visible from a distance of 2 miles.

30

(c) The outer right hand extremity of the nets, as seen by an observer situated as in (b), is marked by day as above (a mast and two balls), and at night by two *fixed* lights, placed vertically, 6 feet (1^m8) apart, the upper *red*, the lower *white*, and visible from a distance of 2 miles.

35

The above-mentioned marks are on the outer limit of the tunny nets, or placed outside it should the lights be a hindrance or obstacle to the fishing.

2. *Smaller tunny fisheries:*

(a) The point where the nets are attached to the shore is marked as above.

40

(b) The outer end of the nets is marked by day by a buoy, boat, or other floating mark surmounted by a mast, 16 feet (4^m9) in height, with two balls, placed vertically, 6 feet (1^m8) apart, and at night by two *fixed* lights, placed vertically, 6 feet (1^m8), apart the upper *red*, the lower *white*, visible from a distance of 2 miles.

45

3. *Tunny fishery nets laid out in an anchorage:*

In addition to the foregoing, every anchor for nets is marked by a buoy, or otherwise.

50

PORT REGULATIONS.—At most of the ports of any consequence in Greece, Albania, Yugoslavia and Italy, vessels are subject to port

regulations, a copy of which should be obtained on arrival. They should be strictly adhered to.

Traffic regulations.—Italian ports.—Sailing vessels, rowing, sailing and steam boats, tugs, or other small craft, when within a radius of one mile from the entrance to any Italian port, or within the waters of any such port, or in the channels, estuaries, or rivers of Italy, must keep out of the way of all steam vessels entering or leaving.

Steam vessels observing a breach of these regulations should draw attention to it by giving not less than four short blasts on their whistle or siren.

Steam vessels navigating in the above areas should do so with caution and at a reduced speed.

Yugoslav ports.—Similar regulations to the above are in force in Yugoslav ports, estuaries, and rivers.

DERATISATION. — QUARANTINE. — In accordance with article 28 of the International Sanitary Convention of 21st June, 1926, deratisation can be carried out and Deratisation and Deratisation Exemption certificates can be issued to a vessel at the following ports :—

Yugoslavia.—Martinšćica, the quarantine harbour of Sušak.

Italy.—Brindisi, Bari, Ancona, Venice, Trieste, and Fiume.

International Quarantine messages can be sent by radio to certain ports in Italy and Greece; for details, see Admiralty List of Radio Signals. These messages can, in no case, take the place of the customary visit of the Health authorities.

SUBMARINE CABLES.—International convention.—The following Articles are taken from the International Convention for the protection of Submarine Telegraph Cables, of 14th March, 1884 :—

II. It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages.

This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.

V. Vessels engaged in laying or repairing submarine cables shall conform to the regulations as to signals which have been, or may be, adopted by mutual agreement among the High Contracting Parties, with the view of preventing collisions at sea.

When a ship engaged in repairing a cable exhibits the said signals, other vessels which see them, or are able to see them, shall withdraw to or keep beyond a distance of one nautical mile at least from the ship in question, so as not to interfere with her operations.

Fishing gear and nets shall be kept at the same distance.

Nevertheless, fishing-vessels which see or are able to see a telegraph-ship exhibiting the said signals, shall be allowed a period of twenty-four hours at most within which to obey the notice so given, during which time they shall not be interfered with in any way.

The operations of the telegraph-ships shall be completed as quickly as possible.

VI. Vessels which see, or are able to see, the buoys showing the position of a cable when the latter is being laid, is out of order, or is broken, shall keep beyond a distance of one-quarter of a nautical mile at least from the said buoys.

Fishing nets and gear shall be kept at the same distance. 5

VII. Owners of ships or vessels who can prove that they have sacrificed an anchor, a net, or other fishing gear in order to avoid injuring a submarine cable, shall receive compensation from the owner of the cable.

In order to establish a claim to such compensation, a statement, 10 supported by the evidence of the crew, should, whenever possible, be drawn up immediately after the occurrence; and the master must, within twenty-four hours after his return to or next putting into port, make a declaration to the proper authorities.

The latter shall communicate the information to the Consular 15 authorities of the country to which the owner of the cable belongs.

CAUTIONS.—Air lights.—Mariners are informed that lights near the coast which have been established for the use of aircraft and which may be visible from seaward, will be shown on Admiralty charts and described in the Admiralty List of Lights. Care should be taken 20 that these lights are not confused with those established for the use of shipping.

Single ships approaching squadrons or aircraft carriers.—

The attention of mariners is called to the danger to all concerned which is caused by single vessels approaching a squadron of warships 25 or merchant vessels in convoy so closely as to involve risk of collision or attempting to pass ahead of or through such a squadron or convoy.

Mariners are therefore warned that single vessels should adopt early measures to keep out of the way of a squadron or convoy.

The fact that it is the duty of a single vessel to keep out of the way 30 of a squadron or convoy does not entitle vessels so sailing in company to proceed without regard to the movements of the single vessel. Vessels sailing in a squadron or convoy should accordingly keep a careful watch on the movements of any single vessel approaching the squadron or convoy and should be ready, in case the single vessel does 35 not keep out of the way, to take such action as will best aid to avert collision.

Attention is also drawn to the uncertainty of the movements of aircraft carriers, which must usually turn into the wind when aircraft are taking off or landing. 40

Charts 1800, 1440, 2158a, 2158b.

CHAPTER II

WEST COAST OF PELOPÓNNISOS FROM CAPE MATAPAN TO CAPE PAPÁS—
ZANTE—GULFS OF PATRAS AND CORINTH.

Charts 682, 1685.

GULF OF MESSINÍA.—The entrance to the Gulf of Messinía (Kalamata) lies between Cape Matapan, called Tainaron by the Greeks, and Cape Akritis (Gallo), about 35 miles north-westward. The gulf is deep and free from dangers in the fairway.

For a description of the coast eastward of Cape Matapan (*Lat. 36° 23' N., Long. 22° 29' E.*), see *Mediterranean Pilot*, Vol. IV.

Aspect.—The eastern shore of the Gulf of Messinía, formerly known as the Gulf of Kalamata, is separated by a comparatively narrow peninsula from the Gulf of Lakonia.

Chart 1685.

This peninsula is mountainous, and between its southern end and Mount Tafyetos (Taygetos), about 35 miles northward of Cape Matapan, the mountain range, which is generally speaking flat-topped, gradually rises, attaining an elevation in Mount Tafyetos of 7,897 feet (2407^m); the summit of the latter mountain, called Áyios Ilías by the Greeks, is nearly always covered in snow.

In clear weather these mountains may be sighted from a great distance, but with south-easterly winds they are often covered with clouds and the lower slopes only are visible.

Chart 682.

The northern shore of the Gulf of Messinía is part of a fertile plain, through which flows the river Pámissos (Pyrnatza); this river flows into the head of the gulf, about 19 miles north-north-eastward of Cape Akritis; several small streams, which are mostly dry in the summer, also flow into the head of the gulf.

The western shore of the gulf is formed by the slopes of Mount Likódhimon (Lykodemos), 3,146 feet (958^m9) high, situated about 13 miles northward of Cape Akritis, and those of the hills between the mountain and the cape.

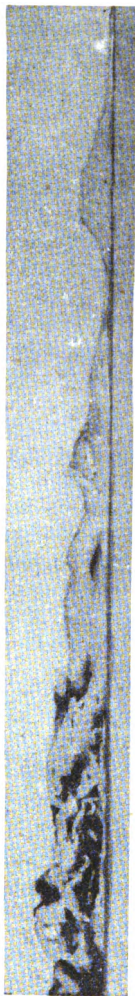
Charts 682, 1685.

Winds and weather.—See local winds, Western coast of Greece, page 13.

Southerly winds seldom blow home, but send a heavy swell into the gulf. In strong southerly winds vessels can find anchorage off Cape Kitriés, on the eastern side of the gulf, about 37 miles north-north-westward of Cape Matapan, or off Almirós (Armyro) about 4 miles northward of Kitriés, also off Petalídhí, on the western shore, about 15 miles northward of Cape Akritis.

Charts 1685, 1800, 2158b.

To face page 53.



*Cape Matapan,
bearing 058°,
22 miles.*

Cape Matapan from the west-south-westward.

(Original dated 1870.)

*Chart 3372.***EASTERN SIDE OF GULF OF MESSINIA.—Cape Matapan.**

—Cape Matapan is the southern extremity of a dark grey marble peninsula which, joined to the peninsula bordering the eastern side of the Gulf of Messina by a narrow isthmus, forms the southern extremity of Pelopónnisos; from the cape the land rises gradually to a peak, 1,025 feet (312^m4) high, about 1½ miles northward of the cape, and then falls abruptly towards the isthmus; Cape Matapan has the appearance of a wedge-shaped island when seen from eastward or westward. When the summit of the cape is below the horizon Mount Miniátika, 3,530 feet (1075^m9) high and flat-topped, situated about 8½ miles north-westward of the 1,025-foot (312^m4) peak mentioned above, will probably be seen, and its southern slope must not be mistaken for the high land above the cape, which will become visible on nearer approach. *See view facing this page.*

Charts 3372, 1685.

When immediately southward of the cape it is difficult to identify, because of the high land behind, but the steep cliffs of Cape Grósso, 8 miles north-westward, forming regular terraces, and Kistéernes hill, about one mile north-eastward of Cape Matapan, are conspicuous.

Chart 3372.

Cape Matapan (*Lat.* 36° 23' N., *Long.* 22° 29' E.) is steep-to, there being a depth of 30 fathoms (54^m9) close off it. The current in its vicinity usually sets westward at the rate of about one knot. When under sail, with strong northerly winds and near the coast, it is necessary to be prepared for the heavy squalls which blow from the high land. A landing can be effected, in fine weather, on the eastern side of the cape.

Chart 1685.

Coast.—Dangers.—Between Cape Matapan and Cape Grósso, about 8 miles north-westward, the coastline recedes, and is fringed in places by sunken rocks.

Karávi rock, situated about 4 miles west-north-westward of Cape Matapan, is 47 feet (14^m3) high, with sunken rocks close off it; Kenísta rock, lying about one cable southward of Karávi rock, is awash. These dangers should be given a wide berth at night.

Chart 3372.

Marmári bay, the southern entrance point of which is situated about 2½ miles north-north-westward of Cape Matapan, is separated from Káyio harbour on the eastern side of the promontory by a saddle-shaped neck of land, and is open westward; Marmári bay may be identified by the saddle-shaped neck of land just mentioned, by an old tower on a hillock on the northern side of the entrance, about 4½ cables northward of the southern entrance point, and by a conspicuous old tower, 445 feet (135^m6) high, situated about 6 cables east-south-eastward of the first tower.

Chart 1685.

Yialí (Iali) bay, the western entrance point of which is situated about 3½ miles west-north-westward of the old tower on the northern side of Marmári bay, is a small inlet, with Yerolimín (Gerolimena) at its head.

Cape Grósso is the south-western extremity of a conspicuous, elevated, and almost level plateau, 1,235 feet (376^m4) high, which rises abruptly from the sea; the coast between Cape Grósso and Cape

Charts 1800, 2158b.

Chart 1685.

Kipoúla, the north-western extremity of this plateau, about $2\frac{1}{2}$ miles north-north-westward, is of a reddish colour and nearly steep-to.

There is a village situated on the plateau just described consisting of 5 scattered houses, and it can be identified by a terrace southward caused by a landslip.

Cape Tigáni, situated about $1\frac{1}{2}$ miles north-eastward of Cape Kipoúla, is the northern extremity of the plateau described above and the south-western entrance point of Port Mézappos; it is a rather high 10 tongue of land, and is conspicuous, being steep, of a whitish colour, and has a level summit with the ruins of a tower on it; being connected with the mainland by lower land southward, it has the appearance of an islet from a distance.

Port Mézappos, which is sheltered from south-westerly winds by 15 Cape Tigáni, has depths of from 20 to 30 fathoms (36^m6 to 54^m7). Good landmarks for making the port, are Mount Miniátika (page 53), and the land between Capes Gróssó and Kipoúla (*Lat.* $36^\circ 31' N.$, *Long.* $22^\circ 21' E.$).

From Port Mézappos the coast trends in a northerly direction for 20 about $9\frac{1}{2}$ miles to the southern entrance point of Port Liménion, and is indented.

Anchorage.—Small craft, with local knowledge, can obtain anchorage off a small cove on the southern side of Marmári bay.

Vessels, with local knowledge, moor in the eastern angle of Port 25 Mézappos, near the houses of Mézappos, the village on its eastern shore.

Lights.—A light is exhibited, at an elevation of 56 feet (17^m1), from an iron column and dwelling, 19 feet (5^m8) in height, situated at Yerolimín, about $6\frac{1}{2}$ miles north-westward of Cape Matapan.

A light is exhibited, at an elevation of 66 feet (20^m1), from an iron 30 column with a masonry base, 16 feet (4^m9) in height, situated on the eastern side of Port Mézappos, about $3\frac{1}{2}$ miles northward of Yerolimín light.

A light is exhibited, at an elevation of 42 feet (12^m8), from an iron column and dwelling, 21 feet (6^m4) in height, situated on the southern 35 side of the entrance to Port Liménion.

Port Liménion.—Port Liménion is the best natural harbour in the Gulf of Messinía, but is open westward; it has steamer communication with other Greek ports. The village of Liméni is situated on the southern side of the port, about half a mile eastward of the light- 40 structure.

The approach to Port Liménion is very deep, but within the entrance the depths decrease gradually from about 19 to 3 fathoms (34^m7 to 5^m5); on the northern side of the entrance there is a depth of 3 fathoms (5^m5).

45 **Coast.—Dangers.**—From Cape Kelefá (Kelepha), the northern entrance point of Port Liménion, the coast trends in a north-north-westerly direction for about 10 miles to Cape Lévktra (Stupar), and is rugged and barren; between Cape Lévktra and Cape Kóurtissa (Kurtissa), about 5 miles north-westward, the coastline forms a bay; 50 Cape Trákhilas (Trakhela), a projecting point, is situated about midway between Capes Kelefá and Lévktra.

A reef extends about half a mile westward and a quarter of a mile north-westward of Cape Lévktra.

An islet lies close offshore, about $2\frac{1}{2}$ miles north-north-westward of

Charts 1800, 2158b.

Chart 1685.

Cape Lévktra. Kardhamlí, a village about half a mile north-north-eastward of this islet, may be seen on a spur of Mount Tafyetos, whose white summit is about 6 miles north-eastward of the coast.

From Cape Kóurtissa the coast trends west-north-westward for about 5 3¼ miles to Cape Kitriés.

The sea breaks heavily during strong south-westerly winds on the coast between Port Liménion and Cape Kitriés (*Lat. 36° 55' N., Long. 22° 08' E.*).

Chart 682.

10

Cape Kitriés, a bold round promontory, 1,148 feet (349^m9) high, is the westernmost point of the eastern shore of the Gulf of Messinía; it is clear of dangers and steep-to. The cape is easily identified and is conspicuous from southward.

From Cape Kitriés the coast trends northward for about 6¼ miles to 15 the head of the gulf.

About three-quarters of a mile north-north-eastward of Cape Kitriés is the southern entrance point of Kitriés bay; this bay is sheltered from southward by the cape, but it is not much used as an anchorage as there are depths of from 18 to 20 fathoms (32^m9 to 36^m6) about half a cable 20 offshore.

During summer the lofty mountains which rise in the vicinity of Kitriés bay, and the calms usual at that season, cause great heat.

Almirós (Armyro) bay, off the village of Almirós, which is situated about 4 miles north-north-eastward of the southern entrance point of 25 Kitriés bay, is somewhat sheltered by Cape Kitriés from south-easterly gales.

The low coast of the plain which forms the head of the Gulf of Messinía begins at the north-eastern head of the gulf, about 1¼ miles northward of Almirós bay, whence it trends westward and west-south- 30 westward for about 11 miles, to 1¼ miles northward of Petalídhí, page 58, when it turns southward to that place. The interior is mountainous.

Chart 1685.

Lights.—A light is exhibited, at an elevation of 33 feet (10^m1), from 35 a white iron column on a masonry base, 16 feet (4^m9) in height, situated at Cape Selínitza, 1¼ miles south-eastward of Cape Lévktra.

A light is exhibited, at an elevation of 42 feet (12^m8), from an iron column, 20 feet (6^m1) in height, situated on the coast, northward of a jetty abreast Kardhamlí, about 4½ miles north-north-westward of Cape 40 Selínitza light-column.

Chart 682.

A light is exhibited, at an elevation of 102 feet (31^m1), from a square tower on a dwelling, 36 feet (11^m0) in height, situated on Cape 45 Kitriés.

Anchorage.—The islet, lying about 2¼ miles north-north-westward of Cape Lévktra and close offshore, affords shelter, off its north-eastern side, to small craft with local knowledge.

Small vessels, with local knowledge, can obtain anchorage close offshore in Kitriés bay and secure to the rocks on the southern side of 50 the bay; the holding ground is good.

Almirós bay affords anchorage in depths of about 10 fathoms (18^m3), under very high land, about 3 cables offshore. A vessel can lie here safely, as the wind from south-eastward does not blow home, although

Chart 682.

a very heavy swell sets in with strong winds from this quarter ; north-westerly winds blow furiously off the plain at the head of the gulf, but the sea is smooth.

5 *Chart 682, with plan of Kalamata harbour.*

Approach to Kalámai.—Kalámai (Kalamata) may be identified from some distance seaward by the acropolis, which may be seen above the trees and is situated about $7\frac{1}{4}$ miles northward of Cape Kitriés light-tower (Lat. $36^{\circ} 55' N.$, Long. $22^{\circ} 08' E.$) ; on nearer approach the
10 breakwater, the head of which lies about $6\frac{1}{4}$ miles northward of the same light-tower, and the houses on the coast in this vicinity, will be seen.

There is temporary anchorage outside the breakwater in a depth of about 12 fathoms (21^m9), sand.

15 **Pilotage.**—Pilotage is compulsory for all foreign merchant vessels making Kalámai.

Chart 682, plan of Kalamata harbour.

Kalámai harbour.—The harbour at Kalámai is formed by a breakwater extending in a southerly direction from the shore for about
20 one cable, thence in a south-easterly direction for about $2\frac{1}{2}$ cables, and then in an easterly direction for about 2 cables, ending in a depth of 22 feet (6^m7).

About $3\frac{1}{4}$ cables eastward of the root of this breakwater a mole extends in a southerly direction for $1\frac{1}{4}$ cables, and about 3 cables
25 eastward of this mole a breakwater, extending in a southerly and south-westerly direction to within about a cable of the light-structure off the breakwater described above. In 1945, the northern portion of the eastern breakwater was awash and the south-western portion was incomplete.

30 **Depths.**—The area between the western breakwater and the mole, and the southern portion of the area between the mole and the eastern breakwater, were dredged, in 1945, to a depth of 28 feet (8^m5).

Lights.—A light is exhibited, at an elevation of 13 feet (4^m0), from an iron column, situated a short distance off the head of the western
35 breakwater.

A light is exhibited, at an elevation of 20 feet (6^m1), from the head of the uncompleted portion of the eastern breakwater.

A light is exhibited, at an elevation of 29 feet (8^m8), from an iron column on a hut, 19 feet (5^m8) in height, situated on the southern
40 extremity of the mole.

Chart 682, with plan of Kalamata harbour.

Kalámai.—Kalámai, near the north-eastern corner of the gulf, is about one mile from the sea, at the foot of a small hill on which is the ancient acropolis of *Pharæ*.

45 The town is surrounded by vineyards and olive plantations, with the wide bed of a mountain stream passing close westward of it ; in winter this stream often becomes a torrent, but in summer the bed is dry. The town is considered healthy, occasional cases of ague, cured by quinine, being the only disease in any degree common. There are civil
50 and military hospitals here.

There is a customs house close to the beach, at the north-western end of the harbour.

In 1945 the population was estimated to be about 39,000.

Communications.—Kalámai is in regular steamer communication

Charts 207, 1685.

To face page 57.



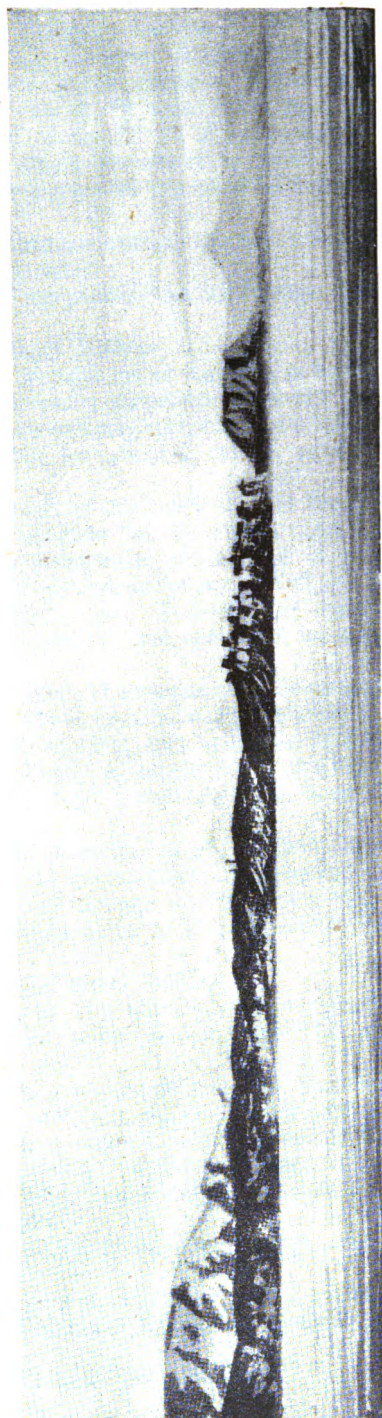
Skhiza I.

Venétiko island.

Sapiéntza I.

*Cape Akritas,
bearing 307°.*

Passage between Venétiko island and Cape Akritas.
(*Original dated 1912.*)



Koróni from the south-eastward, distant 4 or 5 miles.
(*Original dated 1922.*)

Chart 682, with plan of Kalamata harbour.

with Athens and other Greek ports, and is connected to the general railway system.

Supplies.—Supplies and provisions are obtainable ; water can be supplied in a motor tank-vessel, or from hydrants on the quays. 5

Chart 682.

WESTERN SIDE OF GULF OF MESSINÍA.—Coast.—From Cape Akritas, page 52, the coast trends about $6\frac{1}{2}$ miles north-eastward to Cape Livadhiés (Livadia).

Cape Akritas (*Lat.* $36^{\circ} 43' N.$, *Long.* $21^{\circ} 53' E.$) is a steep rugged 10 pinnacle connected to the mainland northward by a low neck of land.

A 5-fathom (9^m1) shoal is situated about $1\frac{1}{2}$ miles south-westward of Cape Livadhiés and about half a mile offshore.

Off-lying islands and rocks.—Venétiko, an island, the northern end of which is situated about 9 cables south-south-eastward of Cape 15 Akritas, is 570 feet (173^m7) high, and is generally steep and rugged ; the northern point of the island is low and shingly. *See view facing this page.*

Rocks extend about one cable south-westward and one cable southward of the south-western and south-eastern extremities of Venétiko, 20 respectively ; a shoal, with a least depth of 3 fathoms (5^m5), extends about $5\frac{1}{2}$ cables north-north-eastward of the northern end of Venétiko, and the depths then increase suddenly.

Petrokáravo, lying from about three-quarters of a mile to one mile southward of the south-eastern point of Venétiko, consist of three 25 above-water rocks, the largest and southernmost being about 30 feet (9^m1) high ; shoal water, with depths of under 10 fathoms (18^m3), extends about 3 cables southward of the southernmost rock and about $1\frac{1}{2}$ cables northward of the northernmost.

Vessels using the channel between Cape Akritas and Venétiko should 30 keep near the cape.

A current, which is affected by the wind, sometimes sets through this channel at a rate of from $1\frac{1}{2}$ to 2 knots.

Anchorage.—During north-easterly winds, which at times blow with great force, vessels can obtain sheltered anchorage in Mémi bay, 35 which is sandy, and lies between Cape Livadhiés and a point about $2\frac{1}{2}$ miles south-westward ; vessels should anchor about half a mile offshore in depths of from 9 to 10 fathoms (16^m5 to 18^m3).

Charts 207, plan of Koróni anchorage ; 682.

Koróni.—Anchorage.—The ruins of a castle are situated on an 40 elevated rocky plateau about a quarter of a mile westward of the eastern extremity of Cape Livadhiés, and are conspicuous, *see view facing this page* ; north-westward of these ruins the town of Koróni extends along the shore.

Koróni had a population of 3,000, in 1929. 45

About $4\frac{1}{2}$ cables west-north-westward of Cape Livadhiés light-structure a mole extends about $1\frac{1}{2}$ cables northward of the town, affording shelter to small vessels from south-easterly winds.

Shoals, with depths of $2\frac{1}{2}$ and 3 fathoms (4^m6 and 5^m5), lie about half a cable west-north-westward and three-quarters of a cable north- 50 north-westward, respectively, of the light-structure on the mole head, and a 5-fathom (9^m1) shoal is situated about $4\frac{1}{2}$ cables north-north-westward of the same light-structure.

Charts 207, 1685.

Charts 207, plan of Koróni anchorage; 682.

From a point about 5 cables west-north-westward of the light-structure on the mole head a reef, which dries, extends in a north-easterly direction to a distance of about one cable; a rock, with a depth of less than 6 feet (1^m8), lies about 2 cables north-north-eastward of the same point, and a 2-fathom (3^m7) shoal, about 1½ cables farther northward.

In front of the town the coast is fringed by rocks.

Large vessels should anchor in depths of from 8 to 10 fathoms (14^m6 to 18^m3), mud, from 4 to 8 cables offshore; the bottom is mostly mud with a few rocks and some patches of weed. This is an excellent anchorage during a south-westerly or westerly gale.

A fair berth should be given to Cape Livadhiés when approaching from southward as a strong current at times sweeps round it; 15 small vessels anchoring inshore should not anchor westward of the town.

Light.—A light is exhibited, at an elevation of 30 feet (9^m1) from an iron column on a dwelling, 16 feet (4^m9) in height, situated on the mole head at Koróni (Lat. 36° 48' N., Long. 21° 58' E.).

20 *Chart 682.*

Coast.—**Dangers.**—From Koróni the coast trends northward for about 10 miles to the southern entrance point of Petalídhí bay, and is fringed in places by rocks. The land is cultivated, and extensive plantations of olive trees cover the lower slopes of Mount Likódhimon,

25 *page 52.*

A 5-fathom (9^m1) shoal is situated about 3½ miles northward of Koróni mole light-structure and about 6½ cables offshore; another shoal, with a similar depth, lies about 6 cables south-eastward of Petalídhí light-structure and about 4 cables offshore.

30 **Anchorage.**—Vessels can obtain good anchorage about 2 miles northward of Koróni and about one mile offshore in depths of from 10 to 12 fathoms (18^m3 to 21^m9), mud and sand. There are some villages on the coast in this vicinity.

Chart 207, plan of Petalídhion bay.

35 **Petalídhí.**—**Anchorage.**—Petalídhí, at the foot of Mount Likódhimon, stands on the shore of a small shallow bay, of the same name, open north-eastward; the southern entrance point of this bay, which may be identified by a white church on it, is low-lying, and extending from it in a north-easterly direction to a distance of about 1½ cables 40 are some rocks and the remains of an ancient mole. The bay is sheltered from all winds, except those from south-eastward, which seldom blow home.

Coasting vessels anchor in shallow water, under lee of the mole, and can remain there during the winter.

45 The anchorage for large vessels is in depths of from 6 to 7 fathoms (11^m0 to 12^m8) about 6½ cables north-north-eastward of the light-structure on the southern entrance point.

Light.—A light is exhibited on the southern entrance point of Petalídhí bay.

50 *Charts 207, plan of Petalídhion bay; 682.*

Coast.—**Anchorage.**—Between the southern entrance point of Petalídhí bay and the mouth of the River Pámissos, about 4½ miles north-eastward, the coast is free from dangers beyond a short distance offshore.

Charts 682, 207.

Charts 682, 1685.

The River Pámissos abounds in fish, particularly lobsters ; the bar has only a depth of 2 feet (0^m6), and it is sometimes dangerous for boats to cross it. Messini (Nisi), a town, is situated about 4 miles up the river.

Chart 682.

Vessels may obtain anchorage off the river mouth in depths of about 8 fathoms (14^m6).

COAST.—Dangers.—Between Cape Akritis and Cape Kolivri, about 7 miles north-westward, the coastline forms a bay, with a sandy beach on its northern shore. The coast is first sandy, backed by a ridge of moderate height, and then rocky to about 3 miles eastward of Cape Kolivri. About 8 cables north-eastward of Cape Kolivri there is an above-water rock, lying close offshore, with some sunken rocks extending about one cable southward of it ; about midway between this above-water rock and Cape Kolivri there is a detached 2½-fathom (4^m6) rocky shoal.

Cape Kolivri (*Lat.* 36° 47' N., *Long.* 21° 46' E.) is a promontory, 228 feet (69^m5) high, having the appearance of a round islet.

Charts 207, plan of Methóni ; 682.

Between Cape Kolivri and a point abreast Koulóúra (Kuluras) islet, about 2½ miles west-north-westward, the coast is bordered by shoal water, which extends as far as 3 cables offshore ; Koulóúra islet, lying on the coastal reef, about 1½ cables offshore, is 43 feet (13^m1) high.

Chart 207, plan of Methóni.

Between Koulóúra islet and Cape Soukoúli (Sukuli), about 7 cables west-north-westward, there is a bay with a sandy shore fringed by a shallow flat, on which there are some sunken rocks and rocks awash. The western side of this bay is formed by a promontory extending about 3 cables southward, and terminating in Cape Soukoúli, to which it is joined by a causeway ; on this promontory is Methóni castle, an old Venetian fortress, now in ruins ; Cape Soukoúli, 53 feet (16^m2) high, is rocky, and on it there is a round tower.

An above-water rock, on which there is a marble pillar, lies about half a cable from the eastern side of the promontory and about 1½ cables north-eastward of Cape Soukoúli ; a mole connects this rock with the promontory westward, and another mole extends about half a cable east-north-eastward of the rock, forming Methóni harbour.

Methóni, a town with a population of 2,119, in 1945, is situated about three-quarters of a mile northward of Cape Soukoúli.

A ridge, with uneven depths and steep-to, extends about 7½ cables southward of Cape Soukoúli to within about one cable of the northern extremity of Sapiéntza island ; on this ridge, situated about 2 and 5½ cables southward, respectively, of Cape Soukoúli, there are a 2½-fathom (4^m6) shoal and a 4½-fathom (7^m8) shoal.

Anchorages.—Anchorage can be obtained, with offshore winds, off the sandy beach on the northern shore of the bay eastward of Cape Kolivri, in depths of from 7 to 8 fathoms (12^m8 to 14^m6), sand.

Methóni harbour affords shelter to small vessels with local knowledge.

Off Methóni, the usual anchorage is in the middle of the bay, about 2½ cables eastward of the round tower on Cape Soukoúli, in a depth of 7 fathoms (12^m8), sand ; it is seldom resorted to except for temporary

Charts 207, 1685.

Chart 207, plan of Methóni.

shelter against strong north-westerly winds. The ridge described above affords some protection from westward, but with south-westerly winds a heavy sea rolls in and renders the anchorage unsafe.

- 5 **Light.**—A light is exhibited, at an elevation of 29 feet (8^m8) from an iron column and hut, 20 feet (6^m1) in height, situated at the eastern end of the mole at Methóni (*Lat.* 36° 49' N., *Long.* 21° 43' E.).

Chart 682.

- Off-lying islands and rocks.—Anchorages.**—The Oinoussai islands, three in number, lie southward of the stretch of coast between Capes Kolivri and Soukoúli. The northern extremity of Skhíza, the south-eastern island, is situated about 1½ miles southward of Cape Kolivri. It has a round hill, 644 feet (196^m3) high, about one mile south-south-eastward of its northern extremity; with the exception of
15 this hill the island is flat, rocky, and barren. Shoal water extends off the island in places as far as 1½ cables.

- Arnátsi rocks, lying about 1½ miles north-north-eastward of the southern extremity of Skhíza, and about 4 cables from the eastern coast of that island, consist of two above-water rocks and a sunken
20 rock close westward of them; the larger above-water rock is black and about 30 feet (9^m1) high. The depths are considerable round these rocks.

- A 4½-fathom (7^m8) rocky shoal lies in the centre of the entrance to Skhíza (Skitza) harbour, about 1½ miles west-north-westward of the
25 southern extremity of the island; this cove is only used by small vessels with local knowledge.

- Ayía Marianí, an islet, the northern end of which is situated about one mile westward of the northern end of Skhíza, is 100 feet (30^m5) high, and has shoal water extending a short distance from its northern and
30 north-eastern sides; the channels on either side of this islet are deep and free from dangers.

- Sapiéntza, the north-western island of this group, is situated with Cape Karsí, its northern extremity, about a mile southward of Cape Soukoúli. It attains an elevation, about one mile southward of Cape
35 Karsí, of 740 feet (225^m5); the slope southward is gradual, and from north-westward the island appears wedge-shaped; an elevated spur projects eastward from the north-eastern part of the island. The light-tower, situated on a peak, about half a mile from the southern end of the island, is conspicuous (*see* view A on chart 207).

- 40 Shoal water extends about 2½ cables northward of the elevated spur.

- Port Longó, on the eastern side of Sapiéntza, about one mile from its southern end, is fronted by an islet with two above-water rocks close south-westward of it; vessels entering Port Longó should pass south-
45 ward and westward of this islet and the rocks, as the channel northward of them is shallow.

Port Longó is only used by small vessels with local knowledge seeking shelter from south-westerly and north-westerly gales; it affords anchorage in depths of from 7 to 10 fathoms (12^m8 to 18^m3).

- 50 Some dark, sharp, above-water rocks, known as Dhío Adhélfia (Thio Adelphi), lie close southward of the southern end of Sapiéntza.

Light.—A light is exhibited, at an elevation of 361 feet (110^m0), from an octagonal tower and dwelling, 26 feet (7^m9) in height, situated on the southern peak of Sapiéntza island.

Charts 207, 1800, 2158b.

Chart 207, plan of Methóni.

Methóni strait.—Methóni strait separates the northern extremity of Sapiéntza island from the south-western end of Pelopónnisos; the fairway is restricted by the shoal water extending from the north-eastern side of Sapiéntza island, and the shoal water extending from the south-western end of Pelopónnisos in that vicinity, also by the ridge extending $7\frac{1}{2}$ cables southward of Cape Soukoúli. 5

A vessel proceeding westward through Methóni strait should keep in mid-channel between these shoal areas, and then pass about three-quarters of a cable northward of Cape Karsí so as to avoid the ridge extending southward of Cape Soukoúli. 10

The current sets westward through Methóni strait at a rate of about one knot during moderate weather.

Charts 211; 207, with plan of Methóni.

Coast.—Dangers.—From Cape Soukoúli the coast trends about 6 miles northward to abreast Pílos (Pylos) islet, and is rocky and steep-to; there is usually a westerly swell breaking on the coast. 15

The hills northward of Methóni rise gradually towards Mount Áyios Nikólaos, which is situated about $1\frac{1}{2}$ miles south-eastward of Pílos islet light-tower, and attains an elevation of 1,588 feet (484^m0). 20

Chart 207, plan of Methóni.

Nísis (Kaliora) islet, situated close offshore and about $4\frac{1}{2}$ cables north-north-westward of Cape Soukoúli, is 5 feet (1^m5) high; Nisopoúla (Nisikulia) islet, the southern end of which is about $3\frac{1}{2}$ cables north-north-westward of Nísis islet, lies close offshore, and is 60 feet (18^m3) high. 25

Chart 207.

There is an above-water rock lying close offshore, about $1\frac{1}{2}$ cables northward of the northern end of Nisopoúla islet.

Chart 211.

Pílos (Pylos) reefs, lying from about $1\frac{1}{2}$ to 2 miles south-south-westward of Pílos islet light-tower, consist of a group of rocky patches, with a least depth of 36 feet (11^m0). In strong winds the sea breaks heavily over Pílos reefs, and vessels should avoid them. These reefs have not been closely examined. 30

A group of rocks, two of which are above water, extends about half a cable westward of a point on the mainland, about one mile south-south-eastward of Pílos islet light-tower. 35

Shoal water, with a least depth of 23 feet (7^m0), extends from about half a cable to $2\frac{1}{2}$ cables offshore, about half a mile northward of the last mentioned point on the mainland. 40

Light.—A light is exhibited, at an elevation of 118 feet (36^m0), from a stone tower and dwelling, 20 feet (6^m1) in height, situated on the south-eastern side of Pílos islet (*Lat.* $36^{\circ} 54' N.$, *Long.* $21^{\circ} 41' E.$). 45

NAVARÍNION BAY.—Navarínion (Navarin) bay, which is entered between Pílos islet and the mainland eastward, is fronted by Sfaktiría (Sphakteria), an island, which completely shelters it from westward; it is the largest harbour in Pelopónnisos, and affords anchorage to large vessels.

The eastern shore of the bay for some distance within the entrance is rocky, bordered by a coastal bank, and should not be approached too closely nor within a depth of 10 fathoms (18^m3), as the depths then decrease suddenly; further northward round the eastern shore it is 50

Charts 207, 1800, 2158b.

Chart 211.

comparatively shallow, there being depths of 5 fathoms (9^m1) about 3 cables from the beach.

The eastern coast of Sfaktiría, forming the western shore of the bay, is rocky, with, generally speaking, depths of 10 fathoms (18^m3) or more at a distance of half a cable off it.

Controlled area.—Navigation was controlled by the Greek government, in 1939, in Navarínon bay and also in the approach within one mile of the coast, from a position, about 1½ miles southward of Pílos islet light, round the western side of Sfaktiría, to a position about 4½ miles northward of the same light. See page 48.

Charts 211, 207.

Aspect.—The position of Navarínon bay can be identified from a long distance seaward by the mountains in its neighbourhood.

15 Mount Likódhimon, with a conspicuous conical peak, is situated about 8 miles eastward of the eastern side of the bay; the summit of a range of mountains, about 12 miles north-north-westward of Mount Likódhimon, attains an elevation of 3,957 feet (1206^m1). The peaks of this range for a distance of about 3 miles northward and southward
30 of it are much lower than the summit, and about 4 miles southward of it, there is a dip or cut in the mountains. On nearer approach Mount Áyios Nikólaos, a conspicuous sharp peak, rises from the coast immediately southward of the entrance; it has a white church on its southern slope.

25 Chart 211.

Pílos islet, with its light-tower, the steep whitish cliffs on the southern part of Sfaktiría, Neókastron, a castle on the eastern side of the entrance to the bay, about 8 cables east-north-eastward of Pílos islet light-tower, and Palaiókastron (Navarin Palaiokastro), a ruined fortress on the
30 northern side of Sikiá strait and about 4½ cables northward of the northern extremity of Sfaktiría, are all good landmarks for making the bay.

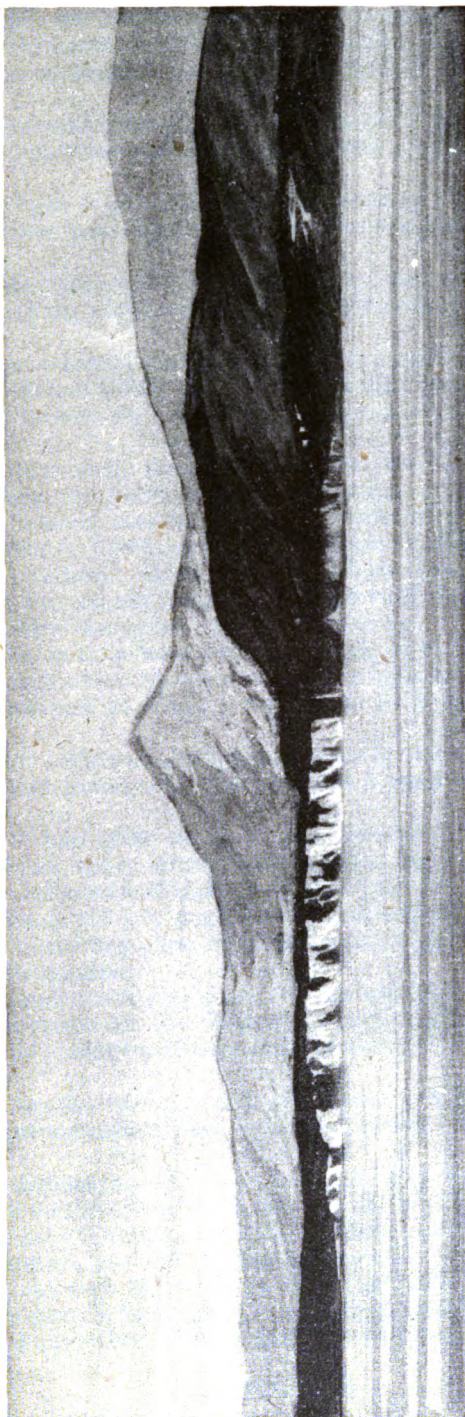
A conspicuous tomb stands on the eastern side of Sfaktiría, about 5½ cables north-north-eastward of the southern extremity of the island.
35 See view facing this page.

The head of the bay is sandy, with extensive lagoons and marshes close within it; the land on the eastern side is cultivated and rises in undulating ridges, with some rivers flowing through the valleys.

Islands and dangers.—Pílos or Tsikhli Baba islet, the northern end
40 of which is situated about 1½ cables southward of the southern end of Sfaktiría, is rocky, and attains an elevation of 121 feet (36^m9); two above-water rocks, one of which is perforated, the aperture resembling an arch, lie close northward of the northern end of Pílos islet. A conspicuous monument is situated on the eastern side of Pílos islet,
45 about three-quarters of a cable northward of the light-tower (*Lat.* 36° 54' N., *Long.* 21° 41' E.).

Sfaktiría is hilly, rocky, and barren, with a few wild olives in the valleys, and attains an elevation in Mount Áyios Ilías (Eliás), about a quarter of a mile southward of its northern extremity, of 499 feet
50 (152^m1). The western coast of Sfaktiría is high, and towards its southern end is composed of steep whitish cliffs; the central part of this coast is slightly indented, with rocky projections, and is fringed by rocks. The eastern coast of the island is also high, and is steep-to.

Charts 207, 1800, 2158b.



Entrance to Navarinon bay from 5 or 6 miles in the offing.

(Original dated 1822.)

Chart 211.

A rocky bank, lying in about mid-channel, about 5 cables north-westward of Neókastron, has a least depth of 47 feet (14^m3).

Khélo, an islet, the southern end of which is situated about 1½ miles northward of Neókastron, is 24 feet (7^m3) high; shoal water extends about 1½ cables southward and about one cable westward and northward of it.

Sfaktiría shoal, which is rocky, is situated with its southern end about 8 cables westward of the southern end of Khélo; it has a least depth of 18 feet (5^m5).

Light.—A light is exhibited from the head of the mole at Pílos harbour, described later, about 1½ miles east-north-eastward of Pílos islet light.

Current.—During northerly winds a current sets out of the harbour, which, with baffling winds, may render it difficult of access to sailing vessels.

Anchorage.—During the summer, vessels usually anchor in a depth of about 10 fathoms (18^m3), about 2½ cables northward of the light on the mole at Pílos harbour. Small vessels can anchor closer in, off the mole.

About 8 cables south-westward of Khélo the bottom consists of sticky mud, and the holding ground is good.

During the winter, vessels anchor in depths of from about 10 to 13 fathoms (18^m3 to 23^m8), about 3½ cables east-north-eastward of the northern end of Khélo; there is less swell here than in other parts of the bay, and the squalls during south-westerly and north-westerly gales, particularly the latter, are not so strong.

A stone pier, with a least depth of 2 feet (0^m6) alongside, is situated at a village about three-quarters of a mile east-north-eastward of the northern end of Khélo; there is a 2-ton movable crane on this pier.

Sikiá strait.—Sikiá strait (Sykias channel), between the mainland and the northern extreme of Sfaktiría, has a least depth of one foot (0^m3).

There is a 15-foot (4^m6) shoal, on the southern side of the western entrance to Sikiá strait, about half a cable north-westward of the north-western extremity of Sfaktiría (*Lat.* 36° 57' N., *Long.* 21° 40' E.).

Pílos.—Pílos (Pylos), a small town, is situated in a valley on the southern side of the bay close north-eastward of Neókastron, the fort of which is dismantled.

A mole extends from the shore, in the western part of Pílos, in a northerly direction for the distance of about half a cable, forming a small harbour; about half-way along its eastern side there are some landing steps.

There is a regular air-service from Athens and Brindisi.

Magnetic observation spot.—See Appendix III, page 605.

COAST.—Dangers.—On a conical hill, 456 feet (139^m0) high, about 4 cables northward of the northern point of the western entrance to Sikiá strait are the remains of Palaiókastron, mentioned on page 62. There are perpendicular cliffs on the northern and eastern sides of the castle, which was once the residence of Nestor, and, in the face of the cliff on its northern side, there is a large cave which bears his name.

Voidhokoiliá cove (Port Voidokoilia), the southern entrance point of

Chart 211.

which is situated about a quarter of a mile northward of Palaiókastron, is a small shallow inlet and is only used by fishing boats ; it is separated by a narrow neck of sand from a large lake.

Chart 207, with plan of Próti channel.

From the northern entrance point of Voidhokoiliá cove the coast trends north-westward for about 7 miles to Cape Máráthos, and is low and rocky with sandy bays, with cultivated plains inland ; the coast is fringed by rocks, and shoal water extends as far as $1\frac{1}{2}$ cables offshore.

Chart 207, plan of Próti channel.

Cape Máráthos is low and rocky, and shoal water extends about 2 cables westward of it ; a detached 5-fathom (9^m1) rocky shoal lies about 4 cables westward of the cape and near the middle of the fairway of Próti strait, which separates the mainland from Próti island, described below. The village of Marathópolis stands on the cape.

Próti island, the north-eastern part of which lies about half a mile westward of Cape Máráthos, is cliffy, except on its north-western side ; the northern part of the island is a small elevated plateau, 605 feet (184^m4) high. Próti island is wooded, covered with brushwood, rocky, and steep-to ; from southward the island appears round, but from westward the northern end appears high and round, and the southern end low.

Light.—A light is exhibited, at an elevation of 32 feet (9^m8), from an iron column on a hut, 19 feet (5^m8) in height, situated on Cape Máráthos.

Anchorage.—During the summer, coasting vessels usually anchor in depths of 7 fathoms (12^m8), about $3\frac{1}{2}$ cables south-westward of Cape Máráthos light-structure ; a heavy swell is experienced here during south-westerly gales.

Marathópolis is in steamer communication with other Greek ports.

Chart 207.

Coast.—Between Cape Máráthos and Cape Koúnellos (Kunello), about $6\frac{1}{2}$ miles northward, the coast is rocky, with two or three streams flowing into the sea, but there are no offshore dangers.

A cultivated plain, with olive plantations and several villages, extends inland to the foot of the high rugged range of mountains, mentioned on page 62, which runs parallel with the coast ; Mount Moréna, 1,250 feet (381^m0) high, situated about 3 miles east-south-eastward of Cape Koúnellos, is isolated, with a conical summit, and is easily identified. From southward the land northward of Cape Koúnellos appears to slope down gradually to a low point.

GULF OF KIPARISSÍA.—Coast.—The Gulf of Kiparissía (Arcadia), called by the Greeks Kólpos Kiparissías, lies between Cape Koúnellos and Cape Katákolon, about 31 miles north-north-westward. The shores of this gulf is backed by a mountain range.

From Cape Koúnellos (*Lat.* $37^{\circ} 10' N.$, *Long.* $21^{\circ} 34' E.$) the coast trends in a north-easterly direction for about 11 miles to Cape Kamaríki, and is rocky, with a few sandy bays into which flow mountain streams ; from southward, as already stated, the land northward of Cape Koúnellos appears to slope gradually down to a low point.

Port Kiparissía is situated about $7\frac{1}{2}$ miles north-eastward of Cape Koúnellos, below a spur of Mount Aigáleos (Psygro) ; this mountain, about $8\frac{1}{2}$ miles east-north-eastward of Cape Koúnellos, is 4,156 feet

Charts 207, 1800.

Chart 207.

(1266^m7) high. The town of Kiparissia is situated at the foot of the ancient Acropolis about half a mile inland. There is a breakwater, about 1½ cables long, at Port Kiparissia.

Northward of Cape Kamariki the shore of the gulf is low and sandy. 5

Between Cape Kamariki and the mouth of the River Alfios (Ruphea), about 22 miles north-north-westward, the coast consists of a clean sandy beach, with several streams flowing into the sea.

About 12 miles northward of Cape Kamariki is the commencement of a chain of lakes, which lies just within the coast and extends about 10 16 miles parallel with it; these lakes are separated from the sea by a narrow strip of sand covered with trees.

Mount Kaiáfa (Kaiffa), 2,445 feet (745^m2) high, situated about 13 miles north-north-westward of Cape Kamariki and about 2½ miles inland, is easily identified. 15

The River Alfios is one of the largest rivers in Pelopónnisos, and boats drawing from 3 to 4 feet (0^m9 to 1^m2) can ascend it for 3 or 4 miles; Mouria marsh, a short distance within the beach, lies about 2½ miles north-north-westward of the mouth of the River Alfios.

Mount Kremásti, 1,165 feet (355^m1) high, is situated about 5½ miles 20 north-north-eastward of the mouth of the River Alfios.

Pirgos, a town, situated on a hill about 7 miles east-north-eastward of Cape Katákolon, is the third largest town in Pelopónnisos, and had, in 1937, a population of 19,336; the plains in the vicinity are cultivated. 25

Chart 207, plan of Katákolon bay.

Cape Katákolon, the southern extremity of Katákolon peninsula is a low tongue of land, which is fringed on its eastern side by sunken rocks; a sandy pit, with a least depth of 2 fathoms (3^m7), lies about 2½ cables eastward of the cape. Vessels rounding Cape Katákolon should give it a berth of not less than half a mile. 30

The ruin of an ancient fortress, 284 feet (86^m6) high, 2 miles northward of Cape Katákolon, is conspicuous.

Light.—A light is exhibited, at an elevation of 149 feet (45^m4), from a grey octagonal stone tower and dwelling, 29 feet (8^m8) in height, situated about 4 cables north-north-eastward of Cape Katákolon (*Lat.* 37° 38' N., *Long.* 21° 19' E.). 35

Katákolon bay.—This bay lies on the eastern side of Katákolon peninsula, and has a sandy beach at its head; it is quite sheltered from westward, but is exposed to southerly winds, which cause a heavy swell.

The depths decrease gradually towards the head of the bay, but rather suddenly towards the town of Katákolon, which is situated about one mile north-north-eastward of Cape Katákolon. 40

Katákolon is connected to the railway system and is in steamer communication with other Greek ports.

Breakwaters.—From the eastern side of Katákolon peninsula, about 45 8 cables north-north-eastward of Cape Katákolon, a breakwater extends from the shore in an easterly direction for a distance of about 2½ cables, and thence in a north-north-easterly direction for about 1½ cables.

From a point on the shore, about 3½ cables northward of the inner end of this breakwater, another extends in an easterly direction for a distance of about 2 cables. These breakwaters form Katákolon harbour. 50

Depths.—The south-western part of the harbour has been dredged to a depth of 15 feet (4^m6), and most of the south-eastern part, to a depth of 28 feet (8^m5), as indicated on the chart.

Charts 207, 1800, 2158b.

Chart 207, plan of Katákolon bay.

There is a depth of 10 feet (3^m0) along the southern side of the northern breakwater.

Light.—A light is exhibited, at an elevation of 30 feet (9^m1), from an iron column and hut, situated at the head of the southern breakwater at Katákolon (*Lat.* $37^\circ 39' N.$, *Long.* $21^\circ 19' E.$).

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

Anchorage.—During the summer months coasting vessels anchor off Agrlí (Agrelías), a small port, situated about $3\frac{1}{2}$ miles north-north-eastward of Cape Kouónellos.

Coasting vessels also anchor during the summer months off Port Kiparissía in depths of about 15 fathoms (27^m4), but this roadstead is exposed to the prevailing north-westerly winds, which cause a heavy swell. There is a small inlet here, open northward, with a mole extending from its western entrance point, which affords shelter to small craft with local knowledge. Kiparissía is in steamer communication with other Greek ports.

During fine weather in the summer vessels can anchor off the mouth of the River Alfíos, about $1\frac{1}{2}$ miles offshore, where there are charted depths of from 10 to 12 fathoms (18^m3 to 21^m9), but with onshore winds a swell is experienced here; the southern side of the entrance to the river, where the shore is steep-to, is the best position for anchoring.

Anchorage can be obtained in depths of $5\frac{1}{2}$ fathoms (10^m1) in Katákolon bay, about $2\frac{1}{2}$ cables north-eastward of the light-structure on the southern breakwater.

Anchorage may be obtained anywhere in the bay where the depths are suitable.

There is good shelter from southerly winds inside Katákolon harbour, in depths of from 4 to $4\frac{1}{2}$ fathoms (7^m3 to 8^m7), but closer inshore the depths decrease and the bottom is rocky.

Chart 207.

Outlying islets.—Strofádhes islets, the eastern of which is situated about 27 miles westward of Cape Kouónellos, consist of two islets; the south-eastern and larger islet is known as Stamfáni (Stamphani), and the north-western islet as Árpia (Harpy rock).

Stamfáni is rocky with cliffs, and has a light-tower on its steep western end, which is its highest part. Not far from a cove, about 2 cables westward of the north-eastern extremity, is a fortified monastery of white stone, about 88 feet (26^m8) high, with a flagstaff on it. See view on chart.

Árpia islet, the southern extremity of which is situated about $3\frac{1}{2}$ cables northward of the north-western extremity of Stamfáni, is much smaller and lower than that islet, and terminates north-westward in a low sandy tongue.

The two islets are connected by a shallow ridge on which are numerous rocks, extending 3 cables south-westward from Árpia islet, under the name of Soumári (Sumari) reefs, and thence around the western end of Stamfáni; the passage between the two islets is encumbered with rocks, and can only be used by boats with local knowledge.

The depths are considerable within a short distance of these islets and Soumári reefs.

Temporary anchorage may be obtained northward of the monastery in depths of from 7 to 15 fathoms (12^m8 to 27^m4), sand and weed;

Charts 207, 1800.

To face page 67.



*Káistro Tornáda,
bearing 100°.*

The coast of Pelopónnisos from Mesokanáli reef.

(Original dated 1912).

Chart 207.

this anchorage should be approached with care, as there are depths of over 50 fathoms (91^m4) about 3 cables from the north-eastern extremity of Stamfáni. The landing place is in the cove near the monastery, where there is a boat slip and pier. 5

Light.—A light is exhibited, at an elevation of 127 feet (38^m7) from a square tower, 36 feet (11^m0) in height, situated on the summit of the western end of Stamfáni (*Lat.* 37° 15' N., *Long.* 21° 00' E.).

COAST.—Dangers.—Between Cape Katákolon and Cape Tripiti (Trepito), about 16 miles north-westward, the coast forms a bay with a low sandy shore, inland within which there is a cultivated plain. 10

Chart 207, plan of Katákolon bay.

The western side of Katákolon peninsula is fringed by rocky shoals; Tigáni, an islet, situated about 2 miles north-north-westward of Cape Katákolon and about half a mile offshore, is 22 feet (6^m7) high, and is fringed by a shallow bank, about a cable wide; Kórakas, an islet, lies on the coastal reef, about one mile northward of Tigáni and close offshore. 15

Chart 207.

Between Cape Katákolon and Cape Palóúki (Paluki), about 7 miles northward, the coast is fringed with rocks, which extend to the distance of about 4 cables south-westward of the latter; about 3 $\frac{1}{2}$ miles northward of Cape Katákolon, there is a detached 2-fathom (3^m7) shoal, lying about 4 cables offshore. Vessels should not approach within one mile of this part of the coast. 20

About 3 $\frac{1}{2}$ miles northward of Cape Katákolon and about a quarter of a mile inland is the conspicuous monastery of Skafidhia (Skaphidia), standing on the foundations of an ancient Venetian fortress, 370 feet (112^m8) high. 25

Mount Mouría (Muria), situated about 3 $\frac{1}{2}$ miles north-eastward of Skafidhia monastery, is 931 feet (283^m8) high. 30

The River Piniós (Gastóúni) flows into the sea about 4 $\frac{1}{2}$ miles north-westward of Cape Palóúki; large boats can ascend this river for several miles.

Cape Tripiti is cliffy on its western side, but between it and Cape Glóssa, about 2 miles east-south-eastward, the shore is sandy; Cape Tripiti is separated from Cape Vasilikós, the nearest point of Zante island, about 8 $\frac{1}{2}$ miles south-westward, by Zante strait. 35

Anchorage.—Vessels may anchor anywhere in the bay between Capes Katákolon and Tripiti during fine weather, in the summer, in depths of from 9 to 12 fathoms (16^m5 to 21^m9), sand. 40

Charts 203, 207.

Coast.—From Cape Tripiti the coast trends in a northerly direction for about 6 miles to the western extremity of Cape Killíni (Glarenza), and is cliffy with a sandy beach; it is backed by high land.

A shallow bank, extending as much as 6 cables offshore, borders this part of the coast. 45

Chart 207.

A small stream flows into the sea about 1 $\frac{1}{2}$ miles northward of Cape Tripiti.

About 3 $\frac{1}{2}$ miles north-north-eastward of Cape Tripiti there is a conspicuous hill, 857 feet (261^m2) high, on which is a very conspicuous castle, named Kástro Tornéze; at the foot of this castle is the small village of Khlemóútsi. See view facing this page. 50

Charts 207, 1800, 2158b.

Chart 207.

Sailing vessels bound to Patras from Zante island usually stand across towards Kástro Torneze until within 3 miles of the mainland, and then steer northward.

5 Chart 203.

Kavkalídhā (Kauphkalida) islet, 18 feet (5^m5) high, lies about 3½ cables west-north-westward of the north-western extremity of Cape Killíni, and is almost connected with the mainland by a reef of sunken rocks; a large above-water rock lies close eastward of this islet.

- 10 Depths of less than 5 fathoms (9^m1) extend as much as 2½ cables westward and 3½ cables northward of Kavkalídhā islet.

Cape Killíni is a rocky projection, with a large above-water rock close off its northern extremity; rocky ground extends about 1½ cables outside this rock, along the north-western face of the cape.

- 15 less than 5 fathoms (9^m1) extend as much as three-quarters of a mile north-westward and northward of Cape Killíni. A wide berth should be given to this cape when rounding it.

Chart 207.

- Prohibited and controlled areas.**—Navigation was prohibited by 20 the Greek Government, in 1939, in an area within one mile of the coast between a position, 3½ miles eastward of Cape Tripití, and a position close eastward of Cape Killíni. This area is indicated on the charts by a pecked line.

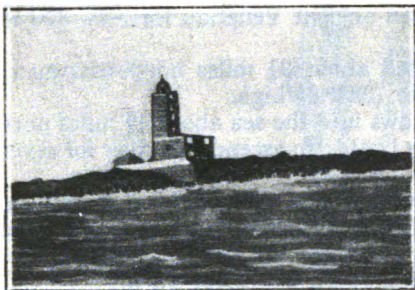
- In 1939, navigation was controlled by the Greek Government within 25 one mile of the coast between Cape Katákolon and a position on the coast 3½ miles eastward of Cape Tripití, and also between Capes Killíni and Kounoupéli, page 73.

See page 48.

Submarine cable.—A submarine cable is landed at Cape Tripití.

Chart 203.

Light.—A light is exhibited, at an elevation of 64 feet (19^m5), from a square masonry tower and dwelling, 49 feet (14^m9) in height, situated on Kavkalídhā islet (Lat. 37° 57' N., Long. 21° 07' E.).



Kavkalídhā lighthouse.

- Off-lying reef.**—Mesokanáli reef (Montague rocks), lying near the middle of Zante strait, about 6½ miles west-south-westward of Kavkalídhā light-tower, has a least depth of 2½ fathoms (5^m0) over it, and is steep-to; the reef is covered by the red sector of Kavkalídhā light 45 between the bearings of 066° and 083°. This reef should be given a wide berth, especially by sailing vessels, as the current is strong in its vicinity.

Charts 203, 207.

- Cape Tripití in line with Cape Katákolon, bearing about 144°, leads 50 about 1½ miles north-eastward of Mesokanáli reef.

Chart 203.

Port Killíni.—On the eastern side of Cape Killíni there is a bay, open northward, and on the western shore of the bay is the small port of Killíni (Glarenza); north-westward of the port, and near Cape

Charts 207, 1800, 2158b.

Chart 203.

Killíni, are the ruins of an ancient town, and the remains of an ancient mole and port.

Killíni is connected with the general railway system, and there is steamer communication with other Greek ports.

From a point on the shore, about half a mile south-eastward of the northern extremity of Cape Killíni, a breakwater extends in a north-easterly direction for the distance of about 2 cables, and thence in an east-south-easterly direction for about $1\frac{1}{2}$ cables. The latter part of this breakwater has been destroyed, and its submerged part constitutes a danger to navigation; a vessel entering this bay should pass half a mile eastward of the visible portion of the breakwater.

Anchorage.—There is excellent anchorage during the summer about three-quarters of a mile eastward of the breakwater at Port Killíni in depths of from 5 to 6 fathoms (9^m1 to 11^m0), sand and mud.

There is also anchorage about $3\frac{1}{4}$ cables eastward of the head of the breakwater in depths of $4\frac{1}{2}$ fathoms (7^m8).

Chart 207.

ZANTE.—**General remarks.**—Zante, an island, called Zákinthos by the Greeks, of which the southern extremity, Cape Marathiá, is situated about 23 miles westward of Cape Katákolon, page 64, lies in the southern approach to the Gulf of Patras.

The western part of Zante is mountainous, the greatest elevation, Mount Vrakhiónas (Vrachonis), situated about $7\frac{1}{4}$ miles southward of Cape Skinári, the northern extremity of the island, being 2,724 feet (830^m3) high. The eastern part of the island is mostly an extensive plain covered with trees and cultivation; Mount Skopós (Scopo), situated about 11 miles east-south-eastward of Mount Vrakhiónas, is a conspicuous, isolated, conical peak, 1,621 feet (494^m1) high; a range of hills extends about 3 miles south-eastward of Mount Skopós, and terminates about one mile northward of Cape Yeráki (Yerákas), the south-eastern extremity (*Lat.* $37^\circ 42' N.$, *Long.* $20^\circ 59' E.$).

Traces of volcanic agency are visible in many parts of the island, and it is subject to severe earthquakes; that which occurred in 1840 split part of the high hill at the back of the town.

The population, in 1937, was 40,492.

Controlled area.—In 1939, navigation was controlled by the Greek Government within one mile of the coast of Zante between a point about 4 miles south-eastward of Cape Skinári and a point about the same distance south-westward of that cape. See page 48.

Southern side.—The Gulf of Kerí lies between Capes Marathiá and Yeráki; this gulf is seldom visited by vessels, as the holding ground, rock and sand, is bad; at the head of the gulf is a sandy beach, within which is the extensive cultivated plain which is the leading feature of the eastern part of the island.

Cape Marathiá has steep cliffs, and is steep-to. From Cape Marathiá the coast trends eastward and northward round the foot of Mount Kerí, a limestone ridge, 1,450 feet (442^m0) high, to Kerí (Kieri) harbour, where there is a single beach.

Marathón, an islet, 488 feet (148^m7) high, is situated about $1\frac{1}{4}$ miles from the north-eastern side of Mount Kerí; it lies at the south-eastern end of a rocky spit extending from the shore in a south-easterly direc-

Chart 207.

tion for about $1\frac{1}{2}$ miles, and has an old tower on its summit ; Marathón is steep, with cultivated terraces and some olive trees.

- 5 Kerí (Kieri) bay lies between this rocky spit and the coast west-south-westward ; Kerí bay affords anchorage in a depth of 7 fathoms (12^m8), about half a mile from the shingle beach at Kerí harbour, situated in the north-western portion of the bay.

The north-eastern side of the Gulf of Kerí is clifty, and is fringed by a yellow flat and scattered sunken rocks.

- 10 Pelouízo (Peluso), an islet, lying $1\frac{1}{2}$ miles west-north-westward of Cape Yeráki, is 282 feet (85^m9) high, and has some trees and brushwood on it ; on its northern side is a monastery in a sandy cove.

- About half a mile west-north-westward of the north-western extremity of Pelouízo there is a shoal, which is steep-to ; it has two 15 rocky heads, of which the northern has a depth of one fathom (1^m8).

On the western side of Cape Yeráki there is a small cove, the entrance to which is encumbered by sunken rocks.

- Cape Yeráki is low, and at night or in foggy weather vessels should be cautious when rounding it, as from south-westward Mount Skopós 20 appears to be isolated.

- Western side.**—From Cape Marathiá the coast trends north-westward for about 14 miles to the southern entrance point of Vrómi harbour, and consists of rugged cliffs, of from about 100 to 300 feet (30^m5 to 91^m4) in elevation ; Vrómi harbour is a small cove, with steep 25 cliffs, where fishing boats occasionally anchor.

Áyios Ioánnis, lying close offshore, about 4 cables west-north-westward of the northern entrance point of Vrómi harbour, is a rocky islet, 110 feet (33^m5) high, and is connected with the coast by rocks.

Charts 203, 207.

- 30 The coast from abreast Áyios Ioánnis has a northerly direction for about $4\frac{1}{2}$ miles to a small projecting point, on which are the ruins of Áyios Yeóryios church, and thence the coast, which is clifty, trends north-eastward for about $3\frac{1}{2}$ miles to Cape Skinári, the northern extremity of Zante.

Chart 203.

Cape Skinári, about 200 feet (61^m0) high, is clifty, with a flat summit, and is steep-to. This cape was reported, in 1945, to lie half a mile east-north-eastward at its charted position.

Chart 207.

- 40 **Lights.**—A light is exhibited, at an elevation of 607 feet (185^m0), from a grey circular tower and dwelling, 30 feet (9^m1) in height, situated on Cape Kerí, about one mile west-north-westward of Cape Marathiá (*Lat.* $37^\circ 39' N.$, *Long.* $20^\circ 50' E.$).

Chart 203.

- 45 A light is exhibited, at an elevation of 216 feet (65^m8), from a circular masonry tower and dwelling, 30 feet (9^m1) in height, situated on Cape Skinári.

Chart 207.

- Eastern side.**—From Cape Yeráki the coast trends northward for 50 about 2 miles to Cape Vasilikós, and shoal water extends a short distance offshore.

Cape Vasilikós is a low tongue of land, with a sandy beach on either side of it, and shoal water extends a distance of about a quarter of a mile from it.

Charts 207, 1800, 2158b.

Chart 207.

From Cape Vasilikós the coast trends north-westward for about $3\frac{1}{2}$ miles to Cape Dhávia (Davia), and is bordered by a shallow flat on which there are some scattered sunken rocks; the latter cape is bluff, and is fringed by sunken rocks.

5

Charts 1609, plan of Zante harbour; 207.

Zante harbour.—This harbour lies at the head of Zante bay which is entered between Cape Dhávia and Cape Krionéri (Kryoneri) about 3 miles north-westward; Cape Áyios Spirídhon (Spyridonos) is situated about $1\frac{1}{2}$ miles west-north-westward of Cape Dhávia; Cape Krionéri is low-lying, and a rocky flat, with depths of less than 6 fathoms (11^m0), extends about $2\frac{1}{2}$ cables eastward and north-eastward of it; the land rises gradually from the cape to the hill behind the town of Zante (*Lat. $37^\circ 47' N.$, Long. $20^\circ 54' E.$*).

10

Zante harbour is exposed to winds from north, through east, to south-east.

15

The town of Zante, called Zákinthos by the Greeks, extends along the shore of the harbour. The Áyios Kharálabos river flows into the harbour, about $6\frac{1}{2}$ cables west-north-westward of Cape Áyios Spirídhon, and about $1\frac{1}{2}$ cables north-north-westward of the mouth of this river is the square yellow tower, with a pointed top, of Áyios Dhionísios (Dionysios) monastery, which is very conspicuous. The castle of Zante, which is now in ruins, is situated on a hill, 522 feet (159^m1) high, behind the town.

20

Chart 1609, plan of Zante harbour.

25

Shoals in eastern approach.—**Buoy.**—Dhimítris (Dimitri) reef, situated about 5 cables northward of Cape Áyios Spirídhon, has a least depth of 6 feet (1^m8) over it; a 6-foot (1^m8) rocky shoal lies close southward of the southern end of Dhimítris reef.

Submarine cables.—Several cables are landed in the northern part of Zante bay, and for the protection of these cables vessels are prohibited from anchoring westward of the pecked line indicated on the plan in this vicinity. A protecting chain, about a quarter of a mile in length, is laid a short distance outside the cables.

25

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

35

Breakwaters.—A breakwater projects about $1\frac{1}{2}$ cables north-eastward from the shore in the vicinity of Áyios Dhionísios monastery; it prevents the silt from Áyios Kharálabos river settling in the harbour.

From the shore, about 5 cables northward of the root of this breakwater, a mole extends in a south-easterly direction for about $2\frac{1}{2}$ cables, affording shelter to small vessels from the strong north-easterly winds which, at times, cause a heavy swell in the harbour. A small jetty projects from the inner side of this mole, about a cable from its head.

40

Depths.—**Berths.**—Shoal water, with depths under 18 feet (5^m5), extends as far as $2\frac{1}{2}$ cables from the southern shore of the harbour.

45

There are depths of from 11 to 15 feet (3^m4 to 4^m6) alongside the inner part of the south-western side of the mole, and a vessel, 300 feet (91^m4) long, drawing not more than 15 feet (4^m6) can berth alongside the outer part of the south-western side of this mole. Vessels, drawing up to 18 feet (5^m5), can moor with their sterns to this portion of the mole.

60

Quays extend along the front of the town, some of which are available for small craft and lighters, but the space is being reduced by silting; the depth alongside the quay near the health office, which is situated

Charts 207, 1800.

Chart 1609, plan of Zante harbour.

close southward of the Harbour Master's office, near the root of the mole, is about 9 feet (2^m7).

Lights.—A light is exhibited, at an elevation of 75 feet (22^m9), from a quadrangular stone tower and dwelling, 32 feet (9^m8) in height, situated on Cape Krionéri. This light was reported, in 1945, to be damaged.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a hut, 15 feet (4^m6) in height, situated on the outer end of the mole (*Lat.* 37° 47' N., *Long.* 20° 54' E.).

Anchorage.—**Directions.**—The usual anchorage is north-eastward of the outer end of the mole in depths of from 40 to 60 feet (12^m2 to 18^m3), mud and sand.

A fair berth for a large vessel is with the light-structure on the outer end of the mole bearing 227° and Cape Krionéri light-tower bearing 336°, in a depth of about 10 fathoms (18^m3).

Small vessels may obtain anchorage off the head of the mole in depths of from 30 to 33 feet (9^m1 to 10^m1), muddy sand.

Charts 1609, plan of Zante harbour ; 207.

A vessel coming from southward and making Zante harbour should give Cape Vasilikós a wide berth, and keep Vóidhi (Trenta Nove), an islet, which is situated about 1½ miles north-westward of Cape Krionéri light-tower, bearing 310° and open north-eastward of Cape Krionéri ; when the head of the mole bears less than 283°, or is in line with the southern end of the castle on that bearing, she will be northward of Dhimítris reef, and may alter course into the harbour.

A vessel approaching from north-westward should give Cape Krionéri a wide berth on account of the rocky flat extending from it, and when rounding the cape should not stand into depths of less than 15 fathoms (27^m4).

Chart 1609, plan of Zante harbour.

Zante.—**Port facilities.**—Zante is in steamer communication with other Greek ports.

The population of the town, in 1937, was about 11,600.

There is a small but well equipped hospital, at which sailors can be received.

A tug is available.

Fresh provisions are available, and good water can be obtained. There is a 15-ton water boat.

Trade.—The exports are currants, olive oil, and wine ; the imports are sulphur, sugar, coffee, iron, coal, petroleum, and textiles.

British Consular officer.—A British Consular officer is stationed at Zante.

Magnetic Observation spot.—See Appendix III, page 605.

Chart 207.

Coast.—**Dangers.**—From Cape Krionéri the coast trends about 1½ miles north-westward to a salient point, close off which is Vóidhi ; this islet is 84 feet (25^m6) high, and has a chapel on its summit.

A 2½-fathom (5^m0) shoal is charted at a distance of about half a mile east-north-eastward of Vóidhi ; in this position the s.s. *Gerano*, drawing 17 feet (5^m2), was reported, in 1928, to have touched the ground.

From the salient point mentioned above the coast trends west-north-westward for about 4½ miles to the south-eastern entrance point of Alikáís (Alilas) bay ; the coast, which is backed by a range of small

Charts 207, 1800.

Chart 207.

hills, is alternating cliff and beach, and shoal water extends as much as 4 cables offshore.

The entrance to Alikáís bay, called Kólpos Alikón by the Greeks, is about $2\frac{1}{2}$ miles wide ; near the south-eastern corner of this bay are some salt pans, from whence the extensive plain, described on page 69, extends south-eastward through the south-eastern part of the island. There is a beach at the head of the bay.

Charts 203, 207.

Cape Katastári (*Lat.* $37^{\circ} 53' N.$, *Long.* $20^{\circ} 44' E.$), about one mile northward of the north-western entrance point of Alikáís bay, is a salient point, on the western side of which is a cove open northward ; this cove is only used by small coasting steamers with local knowledge.

Chart 203.

From Cape Katastári the coast trends north-north-westward for about $3\frac{1}{2}$ miles to Cape Skinári, and is rocky and cliffy.

Áyios Nikólaos, an islet, situated about $1\frac{1}{2}$ miles south-south-eastward of Cape Skinári and about one cable offshore, lies in the entrance to a cove suitable for boats.

Anchorage.—During offshore winds vessels may obtain good anchorage in Alikáís bay, in depths of from 10 to 14 fathoms (18^m3 to 25^m6), good holding ground, about one mile offshore ; small vessels may anchor closer in.

Charts 1676, 207.

COAST.—Dangers.—From Cape Killíni, page 69, the coast trends about 20 miles north-eastward to Cape Papás ; the coastline recedes forming a slight bight, and shoal water, with depths of less than 5 fathoms (9^m1), extends as far as one mile offshore.

Between Cape Killíni and Cape Kounoupéli, about $13\frac{1}{2}$ miles north-eastward, the coast is low and sandy, and inland it is wooded and cultivated.

Chart 203.

The anchorage at Port Killíni, on the eastern side of Cape Killíni, is described on page 69.

Charts 1676, 207.

Kotikhi lake, the southern end of which is about 7 miles east-north-eastward of Cape Killíni, lies just within the coast.

A 5-fathom (9^m1) rocky shoal is situated about 6 miles east-north-eastward of Cape Killíni and about $1\frac{1}{2}$ miles offshore ; a 7-fathom (12^m8) rocky shoal lies about $8\frac{1}{2}$ miles north-eastward of the same cape and about 2 miles offshore.

Chart 1676.

Cape Kounoupéli, 156 feet (47^m5) high, is an isolated rocky point, with the ruins of a tower on its north-eastern part.

From Cape Kounoupéli the coast trends north-north-eastward for about $3\frac{1}{2}$ miles, and consists of a low sandy beach fronting the densely-wooded low land ; thence the coast trends northward for about $3\frac{1}{2}$ miles to Cape Papás, the land rising in dark rounded hills ; Mount Mávro, situated about 3 miles southward of the cape, is the highest of these hills, attains an elevation of 817 feet (249^m0), and is precipitous on its southern side.

Cape Papás (*see* view A on chart) is the north-western extremity of a low shingle spit ; shoal water, with depths of less than 5 fathoms (9^m1),

Charts 207, 1800, 2158b.

Chart 1676.

extends about 7 cables south-westward, 7 cables westward, and 3 cables northward of the cape. This shoal area is covered by the *red* sector of Áyios Sóstis islet light, which is situated $6\frac{1}{2}$ miles northward of Cape Papás, between the bearings of 293° and 010° .

Current.—In the vicinity of Cape Papás a strong current is experienced, caused almost entirely by the wind ; with fresh north-easterly or gulf winds it sets westward at a rate of over $1\frac{1}{2}$ knots, and eastward with north-westerly winds.

Light.—A light is exhibited, at an elevation of 26 feet (7^m9), about 2 cables within the north-western edge of the shingle spit of Cape Papás (*Lat. $38^{\circ} 13' N.$, Long. $21^{\circ} 23' E.$*).

Prohibited and controlled areas.—In 1939, navigation was prohibited by the Greek Government in an area within one mile of the coast between Cape Kounoupéli and a position on the coast about 8 miles south-eastward of Cape Papás. This area is indicated on the chart by a pecked line. In the same year, navigation was controlled within one mile of the coast for a distance of about 7 miles eastward of the last-mentioned position. See page 48.

Outlying buoys.—Two can buoys, painted in red and white bands, were established, in 1946, in the entrance to the Gulf of Patras ; the western buoy is laid at a distance of about $5\frac{1}{2}$ miles west-north-westward, and the eastern at a distance of about 2 miles northward, of Cape Papás light.

GULF OF PATRAS.—The Gulf of Patras (Pátrai), called by the Greeks Patraikós Kólpos, the entrance to which lies between Cape Papás and Oxiá island, about 13 miles west-north-westward, is moderately deep ; the shores of the gulf are mostly low, but are backed by high land.

Fishing fleets.—Large, but straggling, fishing fleets may be encountered in the Gulf of Patras. The nets are towed from vessels in pairs, and the two vessels forming a pair may be anything up to 5 cables apart ; these pairs are easily identifiable by being identical in design and in the trim of their sails, and a vessel should not pass between them.

Winds.—The gulf or north-easterly wind blows for nine months of the year in the Gulf of Patras ; it is first observed along the northern shore under Mounts Varásova and Klókova, whose summits at the same time, if the wind is of any force, become capped with clouds ; Mount Varásova is situated about 23 miles eastward of Oxiá island, and Mount Klókova about 4 miles farther eastward. Towards noon the breeze usually reaches the anchorage off Patras, which is situated on the southern side of the gulf, about 17 miles eastward of Cape Papás, and is succeeded by the land breeze at sunset. In summer a north-westerly wind or sea breeze occasionally blows fresh. See page 13.

Prohibited and controlled areas.—In 1939, navigation was prohibited by the Greek Government in an area within one mile of the coast between Oxiá island and a position on the northern shore of the Gulf of Patras, about 17 miles eastward. This area is indicated on the chart by a pecked line. Navigation was controlled within one mile of the coast for a distance of about 6 miles eastward of the last-mentioned position.

In the same year, navigation was controlled in the entrance to the Gulf of Patras in the area comprised between imaginary lines, joining

Charts 1800, 2158b.

Chart 1676.

the southern end of Oxiá island with Cape Kounoupéli, on its western side, and the position 17 miles eastward of Oxiá island with the position about 8 miles south-eastward of Cape Papás, mentioned on page 74, on its eastern side. *See* page 48.

Southern side of Gulf.—Anchorage.—Directions.—The coast between Cape Papás and Patras forms a bay, the shores of which are mostly low and sandy, with the depths decreasing gradually towards them.

Cape Várdhia, situated about 7 cables eastward of Cape Papás light-tower, is 131 feet (39^m9) high, and has a ruined tower on its summit.

Karavostási bay, on the south-eastern side of Cape Várdhia, affords shelter from southerly and westerly winds, and vessels can obtain temporary anchorage about 1½ miles east-south-eastward of that cape in depths of 13 fathoms (23^m8); this anchorage cannot be recommended, as the wind frequently, and with scarcely any warning, shifts suddenly to the north-east and blows furiously with a heavy short sea. Lake Kalogriá lies just within the shore of this bay.

There is a conspicuous tower on a hill, about 6 miles east-south-eastward of Cape Papás (*Lat.* 38° 13' N., *Long.* 21° 23' E.).

The River Píros, which flows into the gulf, about 9½ miles east-south-eastward of Cape Várdhia, is an inconsiderable stream in summer, but is frequently a raging torrent in winter.

During the strong winds, described above, vessels bound eastward for Patras will, by keeping close to the southern shore of the gulf, carry a strong eddy current with them; the wind here is not so strong and at times a sailing vessel inshore may be almost becalmed when there is a strong breeze one mile offshore. By standing across the gulf, or along the northern shore, the full force of the wind is felt and a strong westerly current experienced. In case of necessity vessels can anchor anywhere along the southern shore.

Boat harbour.—There is a small artificial harbour close westward of Cape Várdhia, enclosed by a mole and a breakwater. The mole projects westward about 200 feet (61^m0) and is quayed on its southern side. The breakwater projects about 350 feet (106^m7) northward. The harbour is liable to silt.

Current.—The current in the vicinity of Cape Papás is described on page 74.

An eddy or counter current sweeps round the southern side of the bay, towards or from Patras, as the case may be, in the opposite direction to the wind. At Patras, during north-easterly winds, the current occasionally sets strongly to windward, and at times, in moderate weather, it changes periodically and so regularly as almost to partake of the nature of tidal streams.

Chart 1225.

Patras.—Patras, called Pátrai by the Greeks, with a population in 1937 of 61,278, is an important commercial town; it stands on the southern shore, near the head of the Gulf of Patras, at the foot of Mount Panakhákon (Voidias), which, standing about 7 miles eastward (chart 1600), attains an elevation of 6,319 feet (1926^m0).

Landmarks.—Áyios Pedalo, situated about 4 cables eastward of Áyios Andréas mole, is the most conspicuous building in the town, standing, with its two white square towers, clear of the other houses; Pandokrátor, about 2 cables eastward of Áyios Pedalo, has three

Charts 1800, 2158b.

Chart 1225.

domes, one being larger than the other two ; the castle, which is in ruins, situated on a hill, 337 feet (102^m7) high, at the back of the town, about one cable northward of Pandokrátor, is fairly conspicuous.

- 5 Pilotage is compulsory for foreign merchant vessels.

Harbour.—The harbour is formed by five moles extending in a north-westerly direction offshore, fronted by a detached breakwater, about 4½ cables long.

- 10 Áyios Andréas, the south-westernmost mole, projects about three-quarters of a cable ; a crane, with a lifting capacity of about 30 tons, is situated onshore near this mole.

Kalávrita mole, about 2 cables north-eastward of Áyios Andréas mole, is about one cable long ; the customs house is near the root of this mole.

- 15 Áyios Nikólaos, the centre mole, and about 20 yards (18^m3) wide, projects about 1½ cables from the middle of the town near the health office, about 2½ cables north-eastward of Kalávrita mole ; there is a disused light-tower on the head of Áyios Nikólaos mole.

- Astings mole projects about three-quarters of a cable from the shore about 2½ cables north-eastward of Áyios Nikólaos mole (*Lat.* 38° 15' N., *Long.* 21° 44' E.).

- Triándi, the north-easternmost mole, is built of rubble, and projects about one cable from abreast the north-eastern end of the detached breakwater. Harbour works were in progress, in 1945, along the 25 quays between Áyios Nikólaos and Astings moles.

In 1945, there were depths of from 3½ to 4 fathoms (6^m4 to 7^m3) along the north-eastern side of Kalávrita mole, and from 1½ to 2 fathoms (2^m3 to 3^m7) along the north-eastern side of Áyios Nikólaos mole.

- When in the harbour, both anchors should be laid ahead, and the 30 stern secured to bollards on the mole. The anchors should be well ahead, as it blows strongly sometimes from westward, taking the vessel on the beam. The holding ground in the harbour is poor, and strong south-south-westerly to west-north-westerly winds always interrupt the working of cargo ; vessels of more than 2,000 tons have to 35 shift berth and anchor outside the breakwater.

Lights.—A light is exhibited, at the south-western end of the breakwater.

A light is exhibited, at an elevation of 40 feet (12^m2), from a red iron column and hut, situated at the north-eastern end of the breakwater.

- 40 A light is exhibited, at an elevation of 20 feet (6^m1), from a white iron column and hut, 16 feet (4^m9) in height, situated on the head of Kalávrita mole. This light was extinguished in 1945.

- A light is exhibited, at an elevation of 26 feet (7^m9), from a red iron column on a hut, 16 feet (4^m9) in height, situated on the head of 45 Triándi mole. This light was extinguished in 1945.

- Anchorage.**—**Submarine cables.**—There is anchorage for large vessels outside the breakwater in depths of from 12 to 16 fathoms (21^m9 to 29^m3), mud and sand ; vessels usually moor with their sterns secured to one end or the other of the breakwater. With the wind from 50 eastward there is no swell, and the wind is not felt.

During autumn and winter, should it be necessary to moor, the anchors should be laid east-north-eastward and west-south-westward of each other, and if any stay is to be made the swivel should be put on, as the winds are variable.

Charts 1225.

Owing to the existence of submarine cables vessels are warned not to anchor northward of a line, indicated on the chart, in a south-westerly direction from the cable house, a white house with a black anchor painted on its western side, situated on the foreshore, about $4\frac{1}{2}$ cables north-north-eastward of the light-structure on Triándi mole (*Lat.* $38^{\circ} 15' N.$, *Long.* $21^{\circ} 44' E.$). 5

Communications.—Patras is connected with the general railway system.

There is steamer communication with all the principal countries of Europe and with New York. 10

There is a regular air-service with the United Kingdom.

Consular officer.—British Consular officers reside at Patras.

Port facilities.—There are several hospitals and nursing homes at Patras. 15

A small quantity of coal is kept in stock, and is supplied from lighters. Only a very small stock of fuel oil, kept in drums, is maintained.

Fresh provisions are obtainable if 24 hours notice be given. The water is generally excellent for drinking, and is supplied in water boats, but in summer, when the supply is limited, it is liable to be contaminated. Water is also laid on to the quays. 20

Above-water repairs to hull and repairs to machinery can be executed.

Tugs and lighters are available. 25

Trade.—The principal exports are currants and sultanas, tobacco, oil, wine, and skins; the principal imports are cereals, groceries, iron, timber, and textiles.

Meteorology.—See table, page 23.

Magnetic observation spots.—See Appendix III, pages 605, 606. 30
Chart 427.

Coast.—From Patras the coast trends north-north-eastward for about $1\frac{1}{2}$ miles to Cape Ayiá (Aghia), and thence north-eastward for about $2\frac{1}{2}$ miles to Cape Ríon (Rhion), and is low-lying; shoal water extends a short distance offshore. Ríon castle stands near the extremity of the latter cape. 35

Light.—Buoy.—A light is exhibited, at an elevation of 52 feet (11^m8), from an iron column on a hut, situated on the northern end of Ríon castle.

A buoy, surmounted by a spar, both painted white, is moored about $1\frac{1}{2}$ cables north-north-westward of Cape Ríon light. 40

Chart 3496.

Northern side of gulf.—Oxiá island.—Oxiá island, page 74, 1,371 feet (417^m9) high, is easily identifiable by its rugged precipitous appearance, and, when first seen, has the appearance of being two islands, as the northern part is much higher than the southern; on either side of the island there is a bay, one open north-westward and the other south-eastward. The island is steep-to on all sides. 45

The peak of Oxiá island, with Mount Koutsouláris (Kutsiláris), 1,414 feet (431^m0) high, on the mainland, about 2 miles east-north-eastward, are excellent landmarks. See view A on the chart. 50

On the northern side of Oxiá island there is a cove, with a beach, affording anchorage to small vessels in depths of from 11 to 12 fathoms (20^m1 to 21^m9).

Charts 1676, 203, 1800.

Chart 3496.

Oxiá island is separated from the mainland eastward by a channel which affords shelter and anchorage to vessels in depths of upwards of 20 fathoms (36^m6).

- 5 There is a landing place at Cape Oxiá, the south-western extremity of the island, but it is difficult to land except in calm weather.

Light.—A light is exhibited, at an elevation of 233 feet (71^m0), from a grey circular tower and stone dwelling, 26 feet (7^m9) in height, situated on Cape Oxiá (Lat. 38° 17' N., Long. 21° 06' E.).

- 10 *Charts 3496, 1676.*

Coast.—**Dangers.**—From Cape Skrófa, about 2½ miles east-north-eastward of Cape Oxiá light-tower, the coast, which is mostly low and sandy, with many inlets to the lakes and swamps in its western part, trends eastward for about 29 miles to Cape Andírrion, on the northern
15 side of the entrance to the Gulf of Corinth.

Cape Skrófa is low and sandy, and within it is an extensive shallow lagoon; a narrow strip of land, terminating in a hillock, 127 feet (38^m7) high, projects about one mile north-westward of the cape, and has the appearance of an island. About one cable north-north-westward of the
20 north-western end of this strip of land is Skrófa islet, 78 feet (23^m8) high; the cove on the eastern side of this islet is only available for boats.

Skrófa shoal, extending about three-quarters of a mile southward of Cape Skrófa, is an extensive sandy flat, with depths of less than 6 feet
25 (1^m8) over it, and is steep-to.

Charts 1676, 203.

The north-eastern end of Oxiá island in line with the northern summit of Dhióni peninsula, about 4½ miles north-north-westward, and the 821-foot (250^m7) peak of Petalás island, about 1½ miles farther north-
30 north-westward, bearing 346°, leads about 3½ cables south-westward of Skrófa shoal; Mount Áyios Stéfanos, 2,133 feet (650^m1) high, on Ithaca, about 19 miles west-north-westward of Cape Oxiá light-tower, bearing 283°, and open southward of Cape Oxiá, leads close southward of this shoal.

- 35 *Chart 1676.*

Between Cape Skrófa and Tholí islet, about 7½ miles eastward, the coast is very low, with sandy hillocks, and is covered with brushwood and coarse vegetation; within it are lagoons. It is shallow close off-
40 shore, but the depths in the approach to the shore decrease gradually; depths of less than 5 fathoms (9^m1) extend in places as far as a mile offshore. Two conspicuous white houses stand about 3½ miles eastward of Mount Koutsouláris and half a mile inland.

Anchorage.—There is temporary anchorage, in depths of from 7 to 12 fathoms (12^m8 to 21^m9), about 2½ miles eastward of Cape Skrófa
45 and, if necessary, anywhere off this stretch of coast. In approaching any part of the low shore on the northern side of the gulf, soundings should be taken frequently, as there is every indication of the shoal water gradually extending southward.

Mesolóngion approach.—Eastward of Tholí islet, in the western
50 approach to Mesolóngion, formerly called Missolonghi, there are a reef and two sandy islets, lying on the coastal bank, Kómma (Kalamurto) reef, Áyios Sóstis islet, and Tourlí islet; the western extremity of Kómma reef is situated about 1½ miles north-eastward of Tholí islet, and about 6 cables east-south-eastward of the eastern extremity of

Charts 1600, 1800, 2158b.

Chart 1676.

Kómma reef is the western extremity of Áyios Sóstis islet ; the western extremity of Tourlí islet lies about 2 miles eastward of the eastern extremity of Áyios Sóstis islet. The last-mentioned islet has a light-tower on it.

The landing pier for Mesolóngion is at Tourlí islet, and a causeway, about $2\frac{1}{2}$ miles long, leads from this islet in a north-north-easterly direction to the town ; the customs house and health office are on Tourlí islet.

Pilots.—Pilots are stationed at Mesolóngion.

Lagoons.—Mesolóngion lagoon, the extent of which can best be seen on the chart, is extensive, with numerous islets and mudbanks ; it is only available for boats with local knowledge. The entrance is close eastward of Áyios Sóstis islet, where a narrow passage for small boats leads in a north-north-easterly direction, passing close westward of Vasiládhi, an islet, on which there is a ruined fort, situated about one mile north-north-eastward of Áyios Sóstis islet light-tower ; Áyios Sóstis islet light, bearing between 198° and 203° , and showing *white*, leads, on the former bearing, through this narrow passage.

A dredged channel, about 54 yards (49^m4) wide, with a least depth of 13 feet (4^m0), in 1945, and marked by light-beacons, leads, from close westward of Tourlí islet, in a northerly direction to a basin close southward of Mesolóngion ; there is a least depth of 19 feet (5^m8) in this basin. The entrance to this dredged channel is marked by light-buoys:

Aitolikón lagoon, the southern end of which is situated about $6\frac{1}{2}$ miles northward of Áyios Sóstis islet light-tower, is reached by a boat passage from the northern end of Mesolóngion lagoon ; this passage, which leads in a northerly direction through mud flats, has a least depth of one foot (0^m3). At the southern end of Aitolikón lagoon stands the small town of Aitolikón on an islet, which is connected on either side with the mainland by bridges.

Lights.—**Light-buoy.**—A light is exhibited, at an elevation of 39 feet (11^m9), from a white, circular, masonry tower, 37 feet (11^m3) in height, situated on the south-eastern extremity of Áyios Sóstis islet, on the western side of the entrance to Mesolóngion lagoon (*Lat.* $38^{\circ} 19' N.$, *Long.* $21^{\circ} 23' E.$).

A light-buoy, exhibiting a *green flashing* light, *every two seconds*, marks the eastern side of the southern entrance of the channel leading to the basin at Mesolóngion.

A light is exhibited on the eastern side of the entrance to the basin.

Anchorage.—Off the coast between Tholí and Áyios Sóstis islets vessels may obtain anchorage in depths of from 6 to 7 fathoms (11^m0 to 12^m8), sand and mud. The depths in this vicinity decrease rapidly towards the shore.

Small vessels may obtain anchorage in a depth of $2\frac{3}{4}$ fathoms (5^m0) about 5 cables eastward of the eastern extremity of Tholí islet ; this anchorage is somewhat sheltered by that islet, and by the shallow ground extending about three-quarters of a mile southward of it.

The anchorage southward of Mesolóngion causeway is known as Tourlí anchorage, and there is anchorage in a depth of $4\frac{1}{4}$ fathoms (7^m8) about three-quarters of a mile south-south-eastward of the southern end of the landing pier.

Mesolóngion.—The town of Mesolóngion, which, in 1937, had

Charts 1800, 2158b.

Chart 1676.

a population of 9,270, stands on a low swampy point ; it is connected to the general railway system, and there is steamer communication with other Greek ports.

- 5 A vessel, 600 feet (182^m9) long, drawing not more than 17 feet (5^m2), can be accommodated at one of the five jetties in the basin.

There is a hospital here.

- Coast.—Light-buoy.—Anchorages.**—Between Tourlí islet and Cape Evínos, about 3½ miles east-south-eastward, the coast is low and
10 sandy, with inlets to lakes and swamps, across some of which are fish stakes ; shoal water extends as much as half a mile offshore.

Cape Evínos is low and shingly.

- A can-shaped light-buoy, exhibiting a *green flashing* light, is moored close southward of the southern end of the shoal water extending south-
15 ward of Cape Evínos.

Áyios Sóstis light (*Lat.* 38° 19' N., *Long.* 21° 23' E.) is obscured over the shoal water extending from this part of the coast.

Between Cape Evínos and Cape Andírrion, about 14 miles eastward, the coast forms a bight.

- 20 Mount Arákinthos (Zyrgos), situated about 8½ miles north-north-eastward of Tourlí islet, is 3,228 feet (983^m9) high, and is a landmark for this part of the coast, as are Mounts Varásova and Klókova ; Mounts Varásova and Klókova are large masses of rock, 2,998 and 3,409 feet (913^m8 and 1039^m1) high, respectively, the latter being
25 a conical peak ; between these two mountains there is a valley. See views B and C on the chart.

- The River Evínos, which flows into the gulf about 2 miles east-north-eastward of Cape Evínos, is navigable by boats for 2½ miles ; the water is fresh, but muddy. In the vicinity of the coast the land is low,
30 with cultivation and villages here and there ; on the western side of the river, for 2 miles from its mouth, it is marshy, but wooded inland ; eastward of the river there is a swamp, behind which the land is thickly covered with olive trees and partially cultivated as far as the foot of Mount Varásova. The hills northward of the low land are covered with
35 pine trees. Two bridges, one a railway bridge, cross the river about 4½ miles from the mouth.

- From the mouth of the River Evínos the coast trends about 2½ miles east-north-eastward to the western entrance point of Kalidhón bay, and is low and wooded ; shoal water, with depths of less than 3 fathoms
40 (5^m5), extends as much as 4 cables offshore.

- Kalidhón bay, which is about 1½ miles wide at its entrance, is a bight in the coast under the south-western face of Mount Varásova ; from the head of this bay a mole projects in a southerly direction for about three-quarters of a cable, where it is marked by a light.

- 45 A channel, which is buoyed, and dredged to a depth of 16 feet (4^m9), leads to the mole ; there are depths of 16 feet (4^m9) alongside the western side of the mole.

- Small vessels with local knowledge may obtain anchorage in Kalidhón bay in depths of from 2½ to 3 fathoms (5^m0 to 5^m5), about
50 2½ cables south-south-eastward of the light on the head of the mole.

There is a regular steamer service between Kalidhón bay and Patras, and this place is connected to the general railway system.

- Cape Khalkís, about three-quarters of a mile eastward of the eastern entrance point of Kalidhón bay, is the steep cliffy southern termination
55 of Mount Varásova.

Charts 1600, 1800.

Charts 1676.

Vasiliki bay is the indentation between Cape Khalkís and a point on the steep coast at the foot of Mount Klókova, about $1\frac{1}{2}$ miles east-north-eastward; the bay affords anchorage for small vessels, except when the wind blows hard from the Gulf of Corinth, which causes a heavy swell. 5

Charts 427, 1676.

The coast for about 2 miles eastward of the eastern entrance point of Vasiliki bay is the base of Mount Klókova, and thence the coast trends east-south-eastward for about $3\frac{1}{2}$ miles to Cape Andírrion (Anti Rhion), and is low and sandy; shoal water, with depths of less than 5 fathoms (9m1), extends as much as 6 cables offshore. 10

There is a castle near the extremity of Cape Andírrion (Lat. $38^{\circ} 20' N.$, Long. $21^{\circ} 46' E.$).

Chart 427.

Light.—A light is exhibited, at an elevation of 49 feet (14m9), from a circular masonry tower, situated on the southern bastion of the castle at Cape Andírrion. This light was reported, in 1945, to be damaged. 15

Chart 1600

GULF OF CORINTH.—General remarks.—The Gulf of Corinth, called by the Greeks Korinthiakós Kólpos, connects the Gulf of Patras with Corinth canal; this canal shortens the distance to Athens from the western coast of Greece by about 150 miles. The gulf is very deep. 20

The southern shore of the gulf is but little indented, and, with the exception of Aífyion bay, the western entrance point of which is situated about 13 miles eastward of Cape Ríon, page 77, has only open roadsteads, but the northern shore is much indented; both shores are steep-to. 25

Within either side of the gulf are bold rugged mountains of from about 4,000 to 8,000 feet (1219m2 to 2438m4) in elevation; at the foot of those on the southern shore there are narrow cultivated plains, intersected by the beds of numerous torrents. 30

Controlled areas.—In 1939, navigation was controlled by the Greek Government in the entrance to the Gulf of Corinth in the area between imaginary lines joining the north-eastern end of the harbour at Patras with a point on the northern shore about 2 miles westward of Cape Andírrion, on the western side, and a point on the southern shore, about 3 miles eastward of Cape Dhrépanon, with a point on the northern shore, about 3 miles north-eastward of Cape Mórnos, on the eastern side. 35 40

Navigation was also controlled in Corinth bay, on the south-eastern side of the head of the gulf, south-eastward of an imaginary line joining Cape Melangávi, with a point on the southern shore about $4\frac{1}{2}$ miles west-south-westward. See page 48. 45

Charts 427, 1600.

Currents.—In The Narrows, the name given to the western entrance to the Gulf of Corinth, the tidal stream turns at the times of high and low water at Trizónia island, which lies close off the northern side of the gulf, about 14 miles eastward of Cape Andírrion; it sets into the gulf with the flood tide and out with the ebb. At springs the tidal stream attains a rate of 2 knots, but its direction and rate are both much influenced by the prevailing wind, if strong; at such times, the ebb 50

Charts 1800, 2158b.

Charts 427, 1600.

stream may attain a rate of $3\frac{1}{2}$ knots in the centre and $5\frac{1}{2}$ knots close inshore, making navigation dangerous.

As the gulf widens eastward of Cape Dhrépanon, about $3\frac{1}{2}$ miles east-north-eastward of Cape Ríon, the tidal stream soon ceases to be felt, and in the middle of the gulf there is no regular set, but a slight drift is frequently set up by the prevailing wind.

Tides.—The tidal action in the gulf, though small, is regular and clearly marked, with a range at springs of a little over 2 feet (0^m6).

10 **Winds and weather.**—During the summer when the wind from the north-west blows strongly it raises a considerable sea in the eastern part of the gulf; during the night at this season it is generally calm.

In the western part of the gulf the prevailing wind is from the north-east; it usually commences at sunrise and increases in force as the 15 entrance is approached, when it forms the gulf wind of the Gulf of Patras. During the summer, when there is often a fresh breeze in the middle of the gulf, it is calm in the Gulfs of Kríssa and Andíkira on the northern shore. See also page 14.

Chart 427.

20 **Entrance of gulf.—Coast.—Submarine cable.**—The passage, known as The Narrows, is between Cape Ríon and Cape Andírrion (Lat. $38^{\circ} 20' N.$, Long. $21^{\circ} 46' E.$). A submarine cable, indicated on the chart, connects these two capes.

The coast between Cape Ríon and Cape Dhrépanon (Drepano), on the 25 southern side of the entrance, consists of a low sandy beach, except for a strip of shingle from about one to 2 miles south-westward of Cape Dhrépanon, which is backed by a steep bank, about 10 feet (3^m0) high. Cape Dhrépanon is a low sandy tongue projecting from low alluvial land, and a spit, which is awash, extends about 3 cables 30 north-westward of it; this spit is steep-to.

A long white watercourse running from near the summit of a mountain to the coast, and flowing into the gulf about one mile east-south-eastward of Cape Dhrépanon, is conspicuous.

Between Cape Andírrion and Cape Mórnos, about $5\frac{1}{2}$ miles east-north-eastward, the coast, on the northern side of the entrance, forms 35 a bay, of which the western shore is a shingle beach, bordered by a shallow flat extending as far as 2 cables offshore; at the head of the bay is the port of Návpaktos, situated about 5 miles north-eastward of Cape Andírrion; the eastern shore of the bay is low and swampy, and 40 forms the delta of the River Mórnos.

Charts 427, 1676, 1600.

Mount Rígani, 4,828 feet (1471^m6) high, with a beacon on it, lies 4 $\frac{1}{2}$ miles north-westward of Návpaktos, and on a spur of this mountain, 639 feet (194^m8) high, situated half a mile within the northern shore, 45 stands the ancient citadel from which the walls diverge downward enclosing the old town. As viewed from seaward, the walls present the form of a triangle. A large portion of the modern town lies eastward outside these walls.

Chart 427.

50 **Lights.**—A light is exhibited, at an elevation of 52 feet (15^m8), from an iron column, 25 feet (7^m6) in height, situated on the eastern side of the entrance to the boat harbour at Návpaktos, about 5 miles north-eastward of Cape Andírrion.

A light is exhibited, at an elevation of 29 feet (8^m8), from a circular

Charts 1600, 1800.

Chart 427.

masonry tower, 23 feet (7^m0) in height, situated on Cape Dhrépanon (Lat. 38° 20' N., Long. 21° 51' E.).

A light is exhibited, at an elevation of 29 feet (8^m8), from a white iron obelisk on a concrete base, situated on Cape Mórnos.

Anchorage.—Anchorage may be obtained from about a quarter to half a mile off Návpaktos in depths of from 7 to 13 fathoms (12^m8 to 23^m8), but it is not safe in bad weather with south-westerly winds.

There is also anchorage about one cable southward of Návpaktos light-structure in depths of from 6 to 7 fathoms (11^m0 to 12^m8).

There is a boat harbour, enclosed by the old walls of the town, in which there is a depth of 11 feet (3^m4).

Návpaktos has occasional steamer communication with other Greek ports.

Prohibited anchorage.—Anchorage is prohibited within a distance of 3 cables of both Cape Ríon and Cape Andírrion, on account of submarine cables and obstructions. The areas are indicated on the chart.

Directions.—The castles on Capes Ríon and Andírrion are easily identified. A vessel should keep midway between the two in order to avoid the obstructions on either side, and steer a north-easterly course for about 2½ miles, when she can alter course towards Cape Mórnos light-structure and steer for it to within a distance of about 1½ miles, when an easterly course, keeping in about mid-channel, may be steered through the gulf. During fresh north-easterly winds, when a strong tidal stream may be expected to set out of the gulf, anchorage can be found off Patras breakwater.

Chart 1600.

Southern side of gulf.—**Coast.**—The whole of the district in the vicinity of this side is well populated. The coast is clear of dangers, and may be approached with discretion. Several mountain torrents flow into the gulf along this coast.

The railway follows the coastline a short distance inland.

Amongst the mountains on the southern side of the gulf may be mentioned Mount Killíni (Zyria), situated about 35 miles east-south-eastward of Cape Dhrépanon light-tower, which attains an elevation of about 7,800 feet (2377^m4).

About 1½ miles eastward of Cape Dhrépanon, the southern shore of the gulf ceases to be low, and high land continues thence to the head of the gulf.

Cape Salmeníkos, low and projecting, is the north-eastern extremity of the delta of the Erineós river, and lies about 8 miles east-south-eastward of Cape Dhrépanon.

About 3½ miles west-south-westward of Cape Salmeníkos and about 1½ miles from the coast is Mount Lóubista, 2,440 feet (743^m7) high, the foot of which reaches the coast.

From Cape Salmeníkos the coast trends south-eastward for about 2½ miles to Cape Rodhodháfni.

Chart 1600, with plan of Aiyion bay.

Aiyion.—Aiyion bay is entered between Cape Rodhodháfni and Cape Yiftissa, about 2½ miles east-south-eastward; both these capes are low and sandy, and vessels should not approach them too closely. The bay, which is open northward, is very deep until within half a mile

Charts 1800, 2158b.

Chart 1600, with plan of Aiyion bay.

of its head, when the depths decrease from about 25 to 10 fathoms (45^m7 to 18^m3) close inshore.

The town of Aiyion, at the head of the bay, when first seen from 5 seaward appears as two towns, the lower town stretches along the shore and is protected by a good sea wall. Parallel with the shore is a range of steep cliffs, from 150 to 200 feet (45^m7 to 61^m0) high, on the top of which is the upper town. The paper mill on the shore, a short distance westward of the town, is conspicuous.

10 Aiyion is connected with the railway system, and is in steamer communication with other Greek ports.

Supplies in small quantities may be obtained.

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

Mole.—**Light.**—A mole projects about half a cable in a northerly 15 direction from the shore near the centre of the town, and steamers with local knowledge may anchor westward of the mole, securing their sterns to it with hawsers. There is a stone quay along the shore below the cliff.

A light is exhibited, at an elevation of 27 feet (8^m2), from an iron 20 column and hut, 16 feet (4^m9) in height, situated on the head of the mole.

Anchorage.—Merchant vessels anchor off the western angle of the town, about 2 cables north-westward of the light-structure on the head of the mole, in depths of about 15 fathoms (27^m4), mud, good holding 25 ground, or, as stated above, anchor westward of the mole, securing their sterns to it. Men-of-war anchor a little farther out.

The anchorage is sheltered from the prevailing winds, which blow strongly up and down the gulf, especially those from eastward during the winter.

30 *Chart 1600.*

Coast.—Between Cape Yíftissa and Cape Akráta, about 12 miles east-south-eastward, the coast is steep and cliffy to within about one mile of the latter cape, with the exception of the low alluvial entrance points of Engáli bay about 6 miles further westward; Cape 35 Akráta is low-lying, and is formed by the alluvium from the River Kráthis.

Avgó hill, with a white conical peak which rises to an elevation of 562 feet (171^m3) close to the shore, 8½ miles east-south-eastward of Cape Akráta, is visible from all parts of the gulf and is an excellent 40 landmark.

A breakwater, about one cable in length, extends from the coast at Vrakháti, a town, situated about 18 miles south-eastward of Avgó hill (Lat. 38° 08' N., Long. 22° 30' E.).

Chart 427.

45 **Northern side of gulf.**—**Coast.**—**Dangers.**—From Cape Mórnos, page 82, the coast, which is low-lying, trends north-eastward for about 3 miles to a red cliffy point, 64 feet (19^m5) high, and is bordered by a shallow flat, extending as much as 2 cables offshore.

Khiliadhóu reef, with a least depth of 3¼ fathoms (6^m9) over it, is 60 situated about 7 cables southward of the red cliffy point and about 6 cables offshore.

Charts 427, 1600.

From the red cliffy point described above the coast trends eastward for about 3½ miles to Cape Marathiá which is low and wooded, and

Chart 1800.

Charts 427, 1600.

thence trends east-south-eastward for about $9\frac{1}{2}$ miles to Cape Psaromita; the coast is steep-to, the high land descending abruptly from the mountains to the coast, except at Cape Marathiá.

Marathiá reef, with a least depth of $2\frac{1}{2}$ fathoms (5^m0) over it, lies about 5 cables south-eastward of the cape of that name.

Chart 1600.

Cape Psaromita is the termination of the mountainous ridge extending in a north-north-westerly direction; it descends in three gradual slopes towards the sea; the ridge for three-quarters of a mile from the end of the cape being only from 400 to 500 feet (121^m9 to 152^m4) high, whence it abruptly rises to from 2,000 to 3,000 feet (609^m6 to 914^m4). The cape is clear of dangers.

Off-lying islands and dangers.—Trizónia, an island, the south-eastern extremity of which is situated about 5 miles north-westward of Cape Psaromita, is 351 feet (107^m0) high, but appears low, as it is close in under the high land, which in this neighbourhood rises to over 5,000 feet (1524^m0); it is separated from the mainland north-eastward by a narrow channel in which there are moderate depths, but this channel is narrowed by a $2\frac{1}{2}$ -fathom (4^m6) shoal lying close eastward of the north-eastern end of the island.

Trizónia is not easily distinguished from a distance westward, but may be identified by the red colour of the cliffs on its southern and western sides. The village of Trizónia is situated on the mainland, close to the beach, abreast the north-eastern part of the island.

A rock, 12 feet (3^m7) high, is situated close north-westward of the north-western extremity of Trizónia.

On the eastern side of the island is a small shallow cove, with an islet, 28 feet (8^m5) high, lying on the southern side of its entrance.

Áyios Ioánnis, an islet, situated about 5 cables eastward of the south-eastern extremity of Trizónia and about 5 cables from the mainland, is 146 feet (44^m5) high; the southern side of this islet is cliffy, white in the western part and red in the eastern, the junction being well defined. The northern side of this islet is foul to a short distance offshore, and a rock awash lies about one cable eastward of its eastern extremity.

Prasoudhi, an islet, situated about one mile eastward of the eastern extremity of Áyios Ioánnis and about 3 cables offshore, is 111 feet (33^m8) high; a rock, 5 feet (1^m5) high and steep-to, lies about 2 cables westward of the northern end of Prasoudhi.

Lights.—A light is exhibited at an elevation of 33 feet (10^m1), from an iron column on a hut, 16 feet (4^m9) in height, situated on the north-eastern side of Trizónia island (*Lat.* $38^\circ 22' N.$, *Long.* $22^\circ 04' E.$).

A light is exhibited, at an elevation of 213 feet (64^m9), from a circular masonry tower and dwelling, 30 feet (9^m1) in height, situated at the end of Cape Psaromita.

Coast.—Dangers.—From Cape Psaromita the coast, which is free from dangers, trends north-eastward for about 3 miles to Eratini, a village at the head of a small bay of the same name; this bay is exposed to south-easterly winds, and has a steep beach. Eratini is the port of a larger village, called Vitrintsa, situated about $1\frac{1}{2}$ miles westward, in a fertile valley extending north-westward.

On the eastern side of Bay of Eratini there is a promontory, attaining an elevation of 240 feet (73^m1), which separates the former

Charts 1800, 2158b.

Chart 1600.

bay from Kiséli bay, eastward; the depths in the latter bay are considerable.

From the head of Kiséli (Panórmos) bay the coast trends south-eastward for about $1\frac{1}{2}$ miles to a salient point, close southward of which is Zombóni rock, 30 feet (9^m1) high; thence the coast trends east-south-eastward for about $1\frac{1}{2}$ miles to Cape Vídhavi (Doúnos), and about one cable eastward of this cape is Xéro, an islet, 16 feet (4^m9) high.

- 10 Cape Vídhavi is the western entrance point of Vídhavi bay; this bay, which is about $1\frac{1}{2}$ miles wide at its entrance, is sheltered from all but southerly and easterly winds, but the depths are considerable.

About a quarter of a mile eastward of the eastern entrance point of Vídhavi bay there is a conspicuous bold bluff, 820 feet (249^m9) high.

- 15 About $2\frac{3}{4}$ miles east-south-eastward of this bluff is Cape Andromákhi, a rounded and bold headland, 305 feet (93^m0) high.

With the exception of the rock and islet described above there are no dangers off-lying the coast between Capes Psaromita and Andromákhi.

- 20 **Light.**—A light is occasionally exhibited, at an elevation of 10 feet (3^m0), from Eratini village (*Lat.* 38° 22' N., *Long.* 22° 13' E.).

Anchorage.—In fine weather, small vessels, with local knowledge, can anchor in Bay of Eratini in a depth of 10 fathoms (18^m3), about one cable offshore.

- Small vessels, with local knowledge, can anchor off the beach of 25 Kiséli bay, in fine weather.

There is fair anchorage for small vessels at a distance of $1\frac{1}{2}$ cables from the head of Vídhavi bay, in a depth of 13 fathoms (23^m8).

Charts 221, 1600.

- Gulf of Kríssa.**—The Gulf of Kríssa, called Kríssaíos Kólpos by the 30 Greeks, the entrance to which lies between Cape Andromákhi and Cape Mákri or Nikólaos, the south-western extremity of Pássalos, a promontory, about $8\frac{3}{4}$ miles east-south-eastward, is the largest indentation on the northern side of the Gulf of Corinth; its shores are mountainous, culminating in Mount Parnassós, 8,051 feet (2453^m9) high, about 35 15 miles northward of Cape Mákri.

- The western shore of the gulf is indented, with several off-lying islets and rocks, but the eastern shore, with the exception of Sikiá bay, the southern entrance point of which is about $3\frac{1}{2}$ miles north-north-westward of Cape Mákri, is unindented, and there are no off-lying 40 dangers.

- Andromákhi bay.**—Andromákhi bay, which is entered between Cape Trákhilos (Trakilos), about $1\frac{1}{2}$ miles north-eastward of Cape Andromákhi, and Poúnda (Pouda), a cape, about one mile north-north-eastward, is a small but deep harbour; the inlet at its south-western 45 end is only suitable for small vessels.

Chart 221.

Cape Trákhilos, which attains an elevation of 338 feet (103^m0), is steep-to on its southern side; Poúnda is 230 feet (70^m1) high.

- Andromákhi reef, situated about 4 cables eastward of Cape 50 Trákhilos, has a least depth of 10 feet (3^m0) over it; a small vessel may pass between it and the land westward, but a large vessel should keep eastward of this reef.

Galaxídhion bay.—Galaxídhion (Galaxídi) bay, which is separated from Andromákhi bay southward, by a promontory, 318 feet (96^m9)

Charts 1600, 1800, 2158b.

Chart 221.

high, has moderate depths, which decrease gradually towards the head of the bay ; it is sheltered by a chain of islets and shoals extending about $1\frac{1}{2}$ miles north-eastward of its southern entrance point.

At the southern end of the bay there are two creeks, one on either side of the town of Galaxídhion ; the south-eastern creek, known as Potamáki, is shallow, and is frequented by coasting steamers.

From the promontory separating the two creeks a narrow spit, with a least depth of $3\frac{1}{4}$ fathoms (5^m9), extends about 2 cables north-eastward, and from the north-western entrance point of the north-western creek another spit, with a least depth of 2 fathoms (3^m7), extends in a north-easterly direction for about $1\frac{1}{4}$ cables.

The town of Galaxídhion stands partly on the promontory between the two creeks described above ; a church, with a conspicuous dome, is situated in the centre of the town, about $1\frac{1}{2}$ cables within the north-eastern end of the promontory. There is steamer communication with other ports in the Gulf of Krissa.

Islets and dangers.—Beacon.—Apsifiá islet (*Lat.* $38^\circ 22' N.$, *Long.* $22^\circ 24' E.$), the southern extremity of which is about 8 cables northward of Poúnda, lies about 2 cables offshore ; it is 28 feet (8^m5) high, and is connected with the mainland south-westward by a shallow flat.

Áyios Yeóryios, the southern extremity of which is situated about 2 cables northward of the northern extremity of Apsifiá islet, is an islet, 72 feet (21^m9) high, and is fringed by a shallow flat.

From the southern entrance point of Galaxídhion bay, a spit, with a depth of less than 6 feet (1^m8), extends in a north-easterly direction for a distance of about 2 cables, and on this spit, at a distance of about $1\frac{1}{4}$ cables offshore, is Pétałos, a flat rock, 2 feet (0^m6) high, and marked by a white stone beacon, 12 feet (3^m7) in height ; a detached 5-fathom (9^m1) rocky shoal lies about $2\frac{1}{4}$ cables north-north-westward of Pétałos, and a similar shoal, with a depth of $4\frac{1}{4}$ fathoms (7^m8) over it, lies about $1\frac{1}{4}$ cables farther northward.

Panayía, the southern end of which is about $3\frac{1}{4}$ cables north-north-eastward of the north-eastern side of Áyios Yeóryios, is an islet, 21 feet (6^m4) high, and is fringed by a shallow flat ; about midway between Áyios Yeóryios and Panayía there is a rocky shoal, with a depth of less than one foot (0^m3) over it. A bank, over which the depths are uneven, extends about half a mile eastward, north-eastward, and northward of Panayía ; near the eastern extremity of this bank there is a rocky shoal with depths of less than 6 feet (1^m8) over it, and a similar shoal lies about $2\frac{1}{4}$ cables east-north-eastward of the islet ; there is a depth of $2\frac{3}{4}$ fathoms (5^m0) at a distance of 3 cables north-north-eastward of the islet and a depth of $4\frac{1}{4}$ fathoms (7^m8) about 4 cables northward of the islet, close to the northern extremity of the bank.

Áyios Dhimítrios, the western extremity of which is situated about 8 cables eastward of the eastern side of Panayía, is an islet, 27 feet (8^m2) high, and shoal water, with depths of less than 3 fathoms (5^m5), extends about half a cable northward, eastward, and southward, and $1\frac{1}{4}$ cables westward of it ; irregular depths extend to a distance of about 4 cables northward of Áyios Dhimítrios, and there is a $4\frac{1}{4}$ -fathom (7^m8) shoal at the northern end of this area, and another $4\frac{1}{4}$ -fathom (7^m8) shoal about $1\frac{1}{4}$ cables farther southward.

Moliménos islet, 10 feet (3^m0) high, situated about one mile north-

Charts 1800, 2158b.

E

Chart 221.

ward of Áyios Dhimitrios and about a quarter of a mile from Cape Tripiti, the bluff northern entrance point of Galaxídhion bay, is fringed by shoal water; a $2\frac{1}{2}$ -fathom (5^m0) shoal lies about $1\frac{1}{2}$ cables west-
 5 south-westward of the western extremity of Moliménos islet.

Chart 1600.

Lights.—A light is exhibited, at an elevation of 65 feet (19^m8), from an iron beacon, 20 feet (6^m1) in height, situated on Cape Mákri.

Chart 221.

- 10 A light is exhibited, at an elevation of 49 feet (14^m9) from a mast on a dwelling, 23 feet (7^m0) in height, situated on Apsifiá islet (*Lat.* 38° 22' N., *Long.* 22° 24' E.).

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron column, situated near the north-eastern end of Galaxídhion, about
 15 $7\frac{1}{2}$ cables westward of Apsifiá islet light.

Anchorages.—**Directions.**—Vessels may obtain anchorage off Galaxídhion in depths of from 8 to 10 fathoms (14^m6 to 18^m3), mud.

- There is also anchorage in Áyios Ilias bay in depths of from 8 to 13 fathoms (14^m6 to 23^m8), mud and fine sand, from about 8 cables
 20 north-north-westward to 8 cables northward of Galaxídhion light.

Charts 221, 1600.

- A vessel proceeding to Galaxídhion bay, from southward should give Cape Andromákhi a fair berth, and this cape should not be brought to bear less than 248° until the eastern extremity of Áyios Dhimitrios is in
 25 line with the western edge of the spur of Mount Koutsouras (Kutsaros), about $3\frac{1}{2}$ miles north-north-eastward, bearing 016°. A vessel should keep on this leading line, which leads close eastward of Andromákhi reef, and, if intending to use the southern entrance to Galaxídhion bay, which is the passage between Apsifiá islet and Áyios Yeóryios, after
 30 passing Andromákhi reef, should steer towards the latter islet, rounding Pétalos at the distance of about one cable; this passage, which is the usual entrance to Galaxídhion bay, has a least depth of $5\frac{1}{2}$ fathoms (10^m1) in the fairway, but there are shoals on either hand, and it should not be used by deep draught vessels.

- 35 The northern entrance to Galaxídhion bay is northward of Panayía, and a vessel coming from southward should pass through a deep channel, about $1\frac{1}{2}$ cables wide, between the shoals eastward of Panayía and those westward of Áyios Dhimitrios; the eastern extremity of Moliménos islet in line with Itéa church dome, about $1\frac{1}{2}$ miles north-
 40 ward, bearing 008°, leads through the fairway of this deep channel, and a vessel should then pass about half a mile northward of Panayía, and proceed to the desired anchorage.

- The entrance northward of Áyios Dhimitrios and Panayía is wide, but, as there are shoals northward of them, a large vessel should round Áyios
 45 Dhimitrios from eastward at a distance of half a mile, and steer westward midway between it and the northern shore of the bay until within the islets, and then steer for the desired anchorage.

Chart 221.

- Itéa harbour.**—**Piers.**—Itéa harbour, situated at the northern end
 50 of the Gulf of Krissa, is entered between a point about $1\frac{1}{2}$ miles north-north-westward of Cape Tripiti and Cape Marathiá, a low sandy point, about 6 cables eastward. At the head of Itéa harbour there are two inlets, the eastern of which is shallow.

There is a small mill, with a conspicuous chimney, on the western

Charts 1600, 1800, 2158b.

Chart 221.

side of the western inlet, about one mile northward of the western entrance point of Itéa harbour.

On the eastern side of the harbour there are two piers, the roots of which are situated at distances of 5 and $5\frac{1}{2}$ cables, respectively, northward of Cape Marathiá; two mooring buoys are moored about half a cable off the head of the southern pier, one north-westward and the other south-eastward.

There is a short pier, with some mooring buoys off it, between the two inlets at the head of the harbour, about 6 cables north-westward of Cape Marathiá (*Lat.* $38^{\circ} 26' N.$, *Long.* $22^{\circ} 24' E.$).

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

Light.—A light is exhibited, at an elevation of 23 feet (7^m0), from a white iron structure on a concrete base, 13 feet (4^m0) in height, at the outer end of the pier extending from the town of Itéa, about $4\frac{1}{2}$ cables east-south-eastward of Cape Marathiá.

Islets and dangers in approach.—Áyios Konstandínos, an islet, 15 feet (4^m6) high, with a building on it, is situated about 3 cables northward of Cape Tripiti; there is a passage for small vessels between the coast and the south-western side of this islet.

Staffidha islet, the western extremity of which lies about $1\frac{1}{2}$ cables east-north-eastward of the eastern side of Áyios Konstandínos, is 19 feet (5^m8) high; Staffidha islet is connected with Áyios Konstandínos by a sunken reef, with a depth of less than 6 feet (1^m8); shoal water, with depths of less than 6 feet (1^m8), extends about $3\frac{1}{2}$ cables south-south-eastward of this reef, and shoal water, with depths of less than 3 fathoms (5^m5), extends as much as a quarter of a cable northward of Áyios Konstandínos and half a cable northward of Staffidha islet.

A coral shoal, with a least depth of $4\frac{1}{2}$ fathoms (8^m2), lies about $2\frac{1}{2}$ cables east-south-eastward of Staffidha islet.

Anchorage.—There is anchorage in depths of from about 8 to 11 fathoms (14^m6 to 20^m1) about $2\frac{3}{4}$ cables south-westward of the light-structure on the pier at Itéa.

There are depths of from 8 to 10 fathoms (14^m6 to 18^m3), good holding ground, over the greater part of the harbour, but shoal water extends from the eastern side of the harbour as much as $1\frac{1}{2}$ cables offshore.

In winter, during north-easterly and north-westerly gales, there is very little shelter in this harbour, as the wind blows down the valleys northward of the town with great force, raising a considerable short sea, which makes boat work difficult.

Itéa.—Pier.—The town of Itéa stretches along the beach eastward of Cape Marathiá; fresh provisions can be obtained. Itéa is the port for Ámfissa, about 7 miles northward; between these two towns there is a fertile plain, covered with olive trees and bounded by mountains.

A pier, about 2 cables long, the outer half of which was under construction, in 1939, extends in a south-south-westerly direction from the centre of Itéa, about half a mile eastward of Cape Marathiá; there are depths of 13 feet (4^m0) alongside the inner half of the western side of this pier. There is a quay at the root of the pier, but it dries alongside.

Itéa is in steamer communication with other Greek ports.

Directions.—A vessel bound for Itéa should pass about half a mile

Chart 221.

eastward of Áyios Dhimítrios, and then bringing it astern, bearing about 197° , steer about 017° ; she must be careful that this islet does not bear less than 197° until a cave on the hillside on the western shore, about three-quarters of a mile north-westward of Cape Tripiti, bears 283° and is open northward of Stafidha islet, when course may be altered north-westward, steering towards Cape Marathiá (*Lat.* $38^{\circ} 26' N.$, *Long.* $22^{\circ} 24' E.$). A vessel should anchor about midway between Stafidha islet and the town in depths of 10 fathoms (18^m3), mud.

Depths of less than 5 fathoms (9^m1) extend as much as 2 cables from the shore, abreast the town.

To enter Itéa harbour a vessel should steer to pass midway between Cape Marathiá and the coast westward, avoiding the elbow of the flat on the southern side of the cape, and anchor, in depths of from 7 to 9 fathoms (12^m8 to 16^m5), north-westward of the cape, sheltered from all winds, except north-easterly and north-westerly gales during winter, as previously mentioned. It is excessively hot at this anchorage in the summer.

Chart 1600.

Gulf of Andíkira.—The Gulf of Andíkira, called Kólpos Andíkira by the Greeks, is entered between Cape Pángalos, the south-eastern extremity of Pássalos, the promontory on the eastern side of the entrance to the Gulf of Kríssa, and Cape Mávro, about 8 miles eastward.

Pássalos is the southern termination of the mountain range which separates the Gulfs of Kríssa and Andíkira, and attains an elevation in Mount Xiroyiánnis of 2,815 feet (858^m0); on the summit of the mountain, about $5\frac{1}{2}$ miles north-north-westward of Cape Pángalos, there is a beacon. Pássalos is steep-to, and presents a broad face seaward.

The western shore of the Gulf of Andíkira, between Cape Pángalos and Cape Trákhilos, about $2\frac{1}{2}$ miles north-north-eastward, is somewhat indented; the coast forms a bay between Cape Trákhilos and a hilly promontory, about $2\frac{1}{2}$ miles north-north-eastward, and the northern shore of this latter bay is indented by three small inlets.

The eastern shore of the Gulf of Andíkira between Cape Mávro and Cape Moúnda, about 5 miles north-westward, is only very slightly indented, and nearly steep-to, the steep slopes of the mountains rising from it.

Mount Verseníkos, 2,326 feet (709^m0) high, rises abruptly from the coast, about $1\frac{1}{2}$ miles east-south-eastward of Cape Moúnda; from this mountain a ridge extends in a south-easterly and easterly direction, parallel with the coast, attaining an elevation in Mount Elikón (Palae-vuna peak), about $8\frac{1}{2}$ miles east-south-eastward of Mount Verseníkos, about 5,740 feet (1749^m6).

The hilly promontory on the western side of the head of the Gulf of Andíkira, attains an elevation in Mount Kefáli, about 6 cables northward of the southern end of the promontory, of 1,136 feet (346^m2); it is joined to the mainland north-westward by a low neck, and its eastern side is almost steep-to.

The village of Áspra Spítia is situated on the coast, on the western side of the head of the gulf, about one mile north-north-westward of Mount Kefáli (*Lat.* $38^{\circ} 21' N.$, *Long.* $22^{\circ} 38' E.$).

Mount Skartzés, 2,926 feet (891^m8) high, situated on the eastern side

Charts 1800, 2158b.

Chart 1600.

of the head of the gulf, about $2\frac{1}{2}$ miles north-north-eastward of Cape Moúnda, has a beacon on its summit.

Áspra Spítia is in steamer communication with other ports in the vicinity. 5

Islets and dangers.—A detached 2-fathom (3^m7) shoal lies close westward of Cape Mávros.

Ámbelos islet, 187 feet (57^m0) high, situated about $2\frac{1}{2}$ miles west-north-westward of Cape Mávros and about 8 cables offshore, is steep and cliffy; Dhaskalió islet, the eastern extremity of which lies about 10 6 cables westward of the western side of Ámbelos islet, is 72 feet (21^m9) high, and has precipitous cliffs, except on its northern side. Both these islets are almost steep-to.

Kassídhis islet, situated about one mile north-north-westward of the northern end of Ámbelos islet and about one cable offshore, is 76 feet 15 (23^m2) high, and is steep-to.

Tsaróúkhi (Tsaruchi) islet, the north-western end of which lies on the western side of the gulf, about 6 cables east-south-eastward of Cape Trákhilos, is 256 feet (78^m0) high; the channel between this islet and the cape is free from dangers. 20

Trákhilos reef, situated about one mile north-eastward of Cape Trákhilos, has a least depth of 5 fathoms (9^m1) over it, and there is a $4\frac{1}{2}$ -fathom (8^m7) shoal lying about $8\frac{1}{2}$ cables north-westward of the same cape and about $3\frac{1}{2}$ cables offshore.

Light.—A light is exhibited, at an elevation of 64 feet (19^m5), from 25 an iron column on a hut, 16 feet (4^m9) in height, situated about $4\frac{1}{2}$ cables eastward of the summit of Mount Kefáli (*Lat.* $38^\circ 21' N.$, *Long.* $22^\circ 38' E.$).

Anchorage.—Vessels can obtain well sheltered anchorage, northward of the promontory on the western side of the head of the gulf, in 30 depths of from 13 to 16 fathoms (23^m8 to 29^m3), about $2\frac{1}{2}$ cables offshore.

Coast.—**Islets and dangers.**—Between Cape Mávros and Cape Velanidhiá, about $2\frac{1}{2}$ miles southward, is Zalítsa bay, which is deep, and is free from dangers, with the exception of a rocky shoal, situated 35 about $8\frac{1}{2}$ cables east-south-eastward of Cape Mávros and about 2 cables from the northern shore of the bay, with a depth of 6 feet (1^m8) over it; the ground is foul between this shoal and the mainland northward, and there are depths of $4\frac{1}{2}$ fathoms (8^m7) extending about 2 cables south-eastward of the shoal. 40

From Cape Velanidhiá the coast trends eastward for about $5\frac{1}{2}$ miles to the western entrance point of Áyios Sarándis bay.

Áyios Sarándis bay, the entrance to which lies between the last-mentioned point and Cape Tamboúrló, about $2\frac{1}{2}$ miles south-south-eastward, has a sandy beach at its head; it is deep, there being 45 depths of 16 fathoms (29^m3) within about a quarter of a mile of its head.

Close southward of Cape Tamboúrló there is an islet of the same name, and Vróma, an islet, 92 feet (28^m0) high, lies about a mile westward of the cape. 50

The Gulf of Alkionídhēs, called Kólpōs Alkionídhon by the Greeks, the entrance to which lies between Cape Tamboúrló and Cape Olmiáí, about $6\frac{1}{2}$ miles south-south-eastward, is on the northern side of the head of the Gulf of Corinth; its northern and eastern shores are

Charts 1800, 2158b.

Chart 1600.

much indented, but its southern shore has only small indentations. The gulf is very deep.

The southern shore of the gulf is the base of the Yeránia mountains.

- 5 Alkionídhēs isles, lying in the entrance of the Gulf of Alkionídhēs, from about $1\frac{1}{2}$ to $2\frac{1}{2}$ miles north-north-eastward of Cape Olmíai, are almost steep-to; Zoódhókos Piyí, the easternmost island, is 394 feet (119^m1) high; these islands being near high land appear lower than they really are.

- 10 On the northern side of the Gulf of Alkionídhēs, between Cape Tamboúrlo and Cape Tsárla, about 3 miles eastward, there is a peninsula, which attains an elevation in Mount Máliaza, about $1\frac{1}{2}$ miles west-north-westward of Cape Tsárla, of 1,125 feet (342^m9).

- Between Cape Tsárla and Cape Petrítis, about $2\frac{1}{2}$ miles eastward, is the entrance to the Gulf of Domvraína, called Kóipos Domvraínis by the Greeks; in its entrance there are three islands, Foniás, 459 feet (139^m9) high, Grombolóúra, 213 feet (64^m9) high, and Máкро, 669 feet (203^m9) high.

- Mount Koromblí, 2,976 feet (907^m1) high, situated about $2\frac{1}{2}$ miles east-north-eastward of Cape Petrítis, has a conical summit, and is
20 conspicuous.

- The shores of the Gulf of Domvraína are rocky and indented; the gulf is deep, and there are no known dangers; Kouvéli, the southern end of which is situated about one mile northward of the northern end of Grombolóúra, is an islet lying from a quarter of a mile to half a mile
25 from the northern shore of the gulf.

The western entrance, between Cape Tsárla and the northern side of Foniás, is the best.

From Cape Petrítis the coast trends about 2 miles east-south-eastward to Cape Panayía, and is steep-to.

- 30 Livadhóstron bay, the entrance to which lies between Cape Panayía and Poúnda, a cape, about $2\frac{1}{2}$ miles eastward, is deep, and is free from dangers; the land, on its western side, rises almost perpendicularly from the coast to the high land of Mount Koromblí (*Lat. $38^{\circ} 12' N.$, Long. $23^{\circ} 04' E.$*).

- 35 Yermainós bay, on the northern side of the head of the Gulf of Alkionídhēs, the entrance to which lies between Poúnda and Cape Yermainós, about $2\frac{1}{2}$ miles east-south-eastward, is deep to within a short distance of the head of the bay; the village of Yermainós is on the low shore of the head of this bay.

- 40 Mount Kidhairón (Elatia), 4,623 feet (1409^m1) high, is situated about 4 miles east-north-eastward of Cape Yermainós.

Chart 1600, with plan of Kórinthos canal.

- Corinth bay.—Corinth (Kórinthos) bay, at the south-eastern end of the Gulf of Corinth, is entered southward of Cape Melangávi, which
45 is situated about $4\frac{1}{2}$ miles north-north-eastward of the breakwater at Vracháti, page 84.

- On the south-western side of the isthmus, at the head of the bay, are the mountains of Pelopónnisos, and on the north-eastern side is high land, which attains an elevation in the summit of the Yeránia
50 mountains, about 13 miles eastward of Cape Melangávi, of 4,432 feet (1350^m9); Mount Melangávi, about $6\frac{1}{2}$ miles east-south-eastward of the cape, is 3,468 feet (1057^m0) high, and is conspicuous to vessels making Corinth bay.

The city of Corinth, called Kórinthos by the Greeks, is situated in

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To face page 93.

Akrokorinthos.



Railway station.

Dome.

Chimney.

*Light structure
on mole.*

Corinth from the roads

(Original dated 1912.)



Western entrance to the Corinth canal

(Original dated 1912.)

Chart 1600, with plan of Kórinthos canal.

the south-eastern corner of the bay, and the entrance to Corinth (Kórinthos) canal is at the head of the bay, about $1\frac{1}{2}$ miles north-eastward of the city.

See views facing this page.

The southern shore of the bay is low and partly cultivated, but the land rises a short distance within it.

About $1\frac{1}{2}$ miles within the southern shore and about $2\frac{3}{4}$ miles south-westward of Corinth is the site of the ancient city of Corinth, situated on the northern side and at the foot of Akrokórinthos, or Acropolis, whose ruins crown a steep and rocky elevation, 1,880 feet (573^m0) high; traces of the ancient city walls are still to be seen.

There are no dangers in the bay, and it is everywhere deep about half a mile offshore.

For control of navigation, see page 81.

Light.—A light is exhibited, at an elevation of 192 feet (58^m5), from a square masonry tower, 41 feet (12^m5) in height, situated on Cape Melangávi (Lat. $38^{\circ} 02' N.$, Long. $22^{\circ} 50' E.$).

Mole.—**Light.**—From the rocks lying close off the northern end of the city, about $5\frac{3}{4}$ miles eastward of the breakwater at Vrakháti, a mole, about half a cable long, projects in a north-easterly direction, and affords protection to the landing place, which consists of two small wooden jetties on its south-eastern side; this mole was being extended, in 1939, and the foreshore south-eastward of its root was being reclaimed.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron structure, situated on the outer end of this mole, but it is unreliable during northerly gales.

Anchorage.—Anchorage may be obtained off Corinth during fine weather, in depths of from 14 to 15 fathoms (25^m6 to 27^m4), about $2\frac{3}{4}$ cables east-north-eastward of the light-structure on the molehead.

Small vessels may obtain anchorage nearer the shore.

A better position during north-westerly winds is off Loutráki, a conspicuous village in the north-eastern corner of the bay, about $2\frac{1}{4}$ miles north-eastward of the light-structure on the molehead at Corinth.

Vessels wishing to anchor off the entrance of Corinth canal must avoid doing so within one mile from the shore in the area northward of the entrance, which is indicated by pecked lines on the chart, owing to the existence of submarine cables.

Corinth.—Corinth had a population, in 1928, of about 10,000. It is connected with the railway system, and is in steamer communication with other Greek ports.

Radio station.—There is a radio station at Corinth.

Chart 1600, plan of Kórinthos canal.

CORINTH CANAL.—Corinth canal runs in a straight line through the Isthmus of Corinth, a distance of a little over 3 miles.

Charts 1800, 2158b.



Cape Melangávi light-tower.

Charts 1600, plan of Kórinthos canal; 2158b.

The saving of distance by the use of the canal as against rounding Cape Matapan, the southern extremity of Greece, is most marked in the case of passages between ports in the Adriatic and on the western coast of Greece and ports in the Aegean and Black seas; to a lesser degree there is a saving of distance between ports on the southern coast of France and western coast of Italy, via Stretto di Messina, and ports in the Aegean and Black seas; thus, from Brindisi to the Piraiévs and İstanbul the saving of distance is about 130 and 100 miles, respectively, and from Messina to the Piraiévs and İstanbul, the saving of distance is about 80 and 50 miles, respectively.

Chart 1600, plan of Kórinthos canal.

Regulations for the navigation of the canal are in force, a copy of which will be supplied on demand.

- 15 The Canal Authority desires previous notice of the intention to proceed through the canal, which can be transmitted by radio, there being a radio station maintained at Isthmia for this purpose; Isthmia (Lat. $37^{\circ} 55' N.$, Long. $23^{\circ} 00' E.$) is a town at the south-eastern end of the canal. The message should give the following particulars:—
20 Vessel's name, nationality, dimensions and net registered tonnage, time of arrival, direction in which vessel is to proceed through the canal, and whether a pilot or tug is required.

In September, 1937, vessels with a draught not exceeding 24 feet (7^m3) were permitted to pass through the canal day and night, except on Thursdays between 0600 and 2000, when dredging usually takes place. If, however, dredging is not taking place on that day, vessels may pass through as usual; vessels will be informed, by radio, of the fact that dredging is not taking place between the following hours:

0600 and 1200, 1400 and 2000,
2200 and 2400.

Depths and dimensions.—The depth of the canal over a bottom width of not less than 69 feet (21^m0) is maintained at $26\frac{1}{2}$ feet (8^m0).

At each end of the canal, which includes the settlement of Posidhonia at the north-western end and the town of Isthmia at the south-eastern end, the sides of the canal, formed by the sloping ground on either side, are not faced with masonry; in these portions of the canal the width at the bottom is 72 feet (21^m9), increasing to 81 feet (24^m7) near the surface, and 164 to 230 feet (50^m0 to 70^m1) at the water level.

The central portion of the canal, about two-thirds of its whole length, passes through a deep cutting of the land, the highest part of which has an elevation of about 250 feet (76^m2); in this cutting the sides of the canal are faced with masonry and the width is 69 feet at the bottom and 81 feet (24^m7) at the water level.

A vessel drawing 24 feet (7^m3) can use the canal at all states of the tide, provided that such vessel's beam does not exceed 46 feet (14^m0); the maximum draught for vessels whose beam exceeds 46 feet (14^m0) is as follows:—

	Beam.	Maximum draught.
Up to	47½ feet (14^m5)	23 feet (7^m0)
50 "	49½ feet (15^m0)	22½ feet (6^m8)
"	50½ feet (15^m5)	21½ feet (6^m6)
"	52½ feet (16^m0)	21 feet (6^m4)
"	54 feet (16^m5)	20½ feet (6^m2)

Charts 1600, 1800, 2158b, 449.

Chart 1600, plan of Kórinthos canal.

Vessels wishing to use the canal, and which draw more than 24 feet (7^m3), should enquire, by radio, the height of the tide in the canal.

The headway below the railway bridge which crosses the canal is 144 feet (43^m9).

Entrances.—The north-western entrance to the canal, in Corinth bay, is protected by two moles, which converge from their inner ends leaving a passage 80 yards (72^m3) wide between their outer ends.

The south-eastern entrance, in Kalamáki bay, is protected by a single breakwater which extends southward from the shore on the northern side of the entrance.

At Posidhonia and at Isthmia, ferry boats, worked on chains which can be sunk to allow vessels to pass, cross the fairway of vessels entering or leaving the canal.

See views facing page 93.

Lights.—A light is exhibited, at an elevation of 16 feet (4^m9), from the moleheads, on each side of the north-western entrance (*Lat. 37° 57' N., Long. 22° 57' E.*).

Lights are exhibited on each side of the canal along its whole length at intervals of a little over one cable.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, on each side of the south-eastern entrance; the eastern of the two lights on the outer end of the breakwater and the western is on the actual western entrance point of the south-eastern end of the canal.

Pilots.—Pilots are placed at the disposal of masters of vessels by the Canal Authority, but no responsibility for grounding or any other accident to a vessel is taken by the Canal Authority or by the pilots.

The pilots place their experience and knowledge of the canal at the disposal of masters, but the handling of the vessel rests with the master.

The signal for a pilot is *two short* blasts on the whistle or siren, and for a tug, *four short* blasts.

Signals.—Signals with regard to entry and also signals to indicate the direction of the tidal stream are made from a signal mast, one at each end of the canal, as follows:—

By day.	By night.	Signification.
Blue flag	One <i>white</i> light	Entry permitted.
Red flag	Two <i>white</i> lights, disposed vertically	Entry prohibited.
Two triangular white flags	One <i>red</i> light over one <i>white</i> light	Stream with the entering vessel.
One triangular white flag	Two <i>red</i> lights disposed vertically	Stream against the entering vessel.

If neither of the above two tidal stream signals are exhibited, there is no stream setting through the canal.

Tidal streams.—The tidal streams setting through the canal are much influenced by the prevailing winds, especially when these have blown continuously in the same direction for two or three days. The rate of the stream never exceeds 3 knots, and seldom exceeds 2½ knots.

Charts 1600, 1800.

E*

Chart 1600, plan of Kórinthos canal.

Winds.—The prevailing winds in the canal are north-westerly, following the direction of the canal, next in frequency are easterly winds, and thirdly northerly winds.

- 5 **Directions.**—Masters of vessels should obtain a copy of the regulations, which will be supplied on demand, before proceeding through the canal.

- 10 No vessel may enter the canal until permission is given by the Canal Authority, and until the signal indicating that entry is permitted is exhibited.

Steam vessels may proceed through under their own steam, but the employment of tugs is recommended for the larger vessels that are able to pass through the canal.

Sailing vessels must be towed through.

- 15 The best time to pass through the canal, especially in the case of large vessels, is when the stream is adverse, as they will be more under command.

- 20 At the extremities of the canal, where the width at the bottom is very much less than the width at the water level, care will be required to keep in the deepest part.

With northerly winds, special care is required when entering the north-western end of the canal.

Charts 1600, 1800.

CHAPTER III

CEPHALONIA, ITHACA, LEVKÁS, AND THE ADJACENT COAST OF GREECE,
INCLUDING THE GULF OF AMVRAKÍA, THE COAST OF ALBANIA,
CORFU AND ITS ADJACENT ISLANDS.

Chart 203.

CEPHALONIA.—General remarks.—Cephalonia, called Kefalínia by the Greeks, the southern extremity of which, Cape Moúnda or Skála (Monda or Scala), is situated about $8\frac{1}{4}$ miles north-north-eastward of Cape Skinári, page 70, is the largest of the Ionian islands, and is considerably indented; Argostólion bay, situated on the southern side of Cephalonia, and Sámi (Samos) bay, on the eastern side of the island, are excellent harbours. 5

Cephalonia is mountainous, a calcareous ridge traversing nearly the whole length of the island, and attaining an elevation in Mount Afnos (Nero), about $7\frac{1}{4}$ miles north-westward of Cape Moúnda (*Lat.* $38^{\circ} 04' N.$, *Long.* $20^{\circ} 48' E.$), of 5,305 feet (1,617^m0). See view facing page 100.

There is a large number of towns and villages in the island, and, in 1937, the population numbered 66,414.

The climate is generally healthy, but fever is prevalent in one or two marshy districts during the summer, especially near Sámi (Samos), a village on the south-eastern side of Sámi bay.

Prohibited and controlled areas.—In 1939, navigation was prohibited by the Greek Government within one mile of the coast of Cephalonia between a point about $2\frac{1}{4}$ miles northward of Cape Moúnda and a point about $4\frac{1}{4}$ miles westward of that cape. This area is indicated on the chart by a pecked line. 20

Navigation was controlled within one mile of the coast from a point about $4\frac{1}{4}$ miles westward of Cape Moúnda to a point about 15 miles further west-north-westward. This area includes Argostólion bay. See page 48. 25

Communications.—There is frequent steamer communication with Italy and Great Britain.

Southern side of Cephalonia.—Dangers.—Cape Yerogómbos (Gheroghambo), the western extremity of the southern coast of Cephalonia, situated about 22 miles west-north-westward of Cape Moúnda, is rocky, and has a sunken reef extending about one cable southward of it; some sunken rocks extend about the same distance north-westward of the cape. 30

Charts 1557, 203.

From Cape Yerogómbos the coast trends in a south-easterly direction for about $2\frac{1}{4}$ miles to Cape Petrókhalo (Petrochalon), the south-eastern extremity of Akrotíri promontory, and is fringed by rocks and shoal water extending a short distance offshore; the coast is cliffy to within 35

Charts 1676, 1800, 2158b.

Charts 1557, 203.

about one mile north-westward of Cape Petrókhalo whence it is low-lying.

Between Cape Yerogómbos and Cape Skíza (Skisa), about one mile east-south-eastward, there is a small rocky bay. On Cape Skíza there is a watch-tower (*Lat.* $38^{\circ} 10' N.$, *Long.* $20^{\circ} 23' E.$).

Chart 1557.

Off Akrotíri promontory the ground is foul, and rocks and shoal water extend as much as 3 cables in a south-south-easterly direction ;
 10 Akrotíri reefs extending as much as $1\frac{1}{4}$ miles south-south-eastward of the promontory, and which break occasionally, have a least depth of $3\frac{1}{4}$ fathoms (6^m4) over them, and are covered, with the exception of their southern edge, where there is a least depth of $4\frac{1}{4}$ fathoms (7^m8), by a *red* sector of Vardhiánoi light, which is situated about 2 miles
 15 east-south-eastward of Cape Petrókhalo, between the bearings of 090° and 113° .

The white tower of the monastery, 203 feet (61^m9) high, situated southward of the village of Miniés (Mignies), about $3\frac{1}{4}$ miles eastward of Vardhiánoi light, in line with a mill without sails, situated on a hill,
 20 632 feet (192^m6) high, about half a mile eastward of the monastery tower, bearing 087° , leads southward of Akrotíri reefs and all the dangers in that vicinity.

Chart 203.

Light.—A light is exhibited, at an elevation of 161 feet (49^m1), from
 25 a yellow square masonry tower and dwelling, 51 feet (15^m5) in height, situated on Cape Yerogómbos. The light-tower does not show distinctly against the land behind it.

Chart 1557.

Coast.—**Dangers.**—Between Cape Petrókhalo and Cape Áyios
 30 Yeóryios (St. Georgios), about $2\frac{1}{4}$ miles east-north-eastward, the coast forms two bays separated by Cape Xí (Kse), about one mile east-north-eastward of Cape Petrókhalo.

Akrotíri bay, the western of these two bays, is encumbered with rocks, and between this bay and the north-western extremity of Vardhiánoi, an island, situated about one mile south-south-eastward of
 35 Cape Xí, the bottom is rocky and uneven, with several detached shoals ; one of the latter, with a least depth of $3\frac{1}{4}$ fathoms (6^m4) over it, lies about 6 cables south-eastward of Cape Petrókhalo. The eastern of the two bays is bordered by a bank, with depths of less than
 40 5 fathoms (9^m1) over it, as much as 4 cables wide in its western part.

Vardhiánoi shoal, lying about one mile south-westward of Cape Áyios Yeóryios, has a least depth of 3 fathoms (5^m5) over it ; some detached shoals, with a least depth of $4\frac{1}{4}$ fathoms (8^m2) over them, the positions of which can best be seen on the chart, lie between Vardhiánoi shoal
 45 and the shore north-westward and northward.

Kalafáti reefs, which break and over which there are depths of less than 6 feet (1^m8), extend about 8 cables south-south-eastward of Cape Áyios Yeóryios, and there is broken and rocky ground close eastward of these reefs ; a *red* sector of Vardhiánoi light, between the bearings of
 50 203° and 215° , covers the greater part of Kalafáti reefs.

A bank, with depths of less than 5 fathoms (9^m1) over it, extends $3\frac{1}{4}$ cables south-eastward, and $2\frac{1}{4}$ cables eastward of Cape Áyios Yeóryios ; there are above-water and sunken rocks on this bank close offshore.

Off-lying island.—**Light.**—Vardhiánoi (Vardiani), an island lying

Charts 203, 1800, 2158b.

Chart 1557.

on the western side of the approach to Argostólion bay, is bordered by a rocky bank, with depths of less than 5 fathoms (9^m1) over it, which extends as much as 2½ cables southward and 5 cables westward of it; from the north-eastern side of the island the bank extends about 3½ cables, and to within a short distance of the southern end of Vardhiánoi shoal.

In the centre of Vardhiánoi island are the low white buildings of a monastery; the north-western end of the island is a narrow cliffy projection, 67 feet (20^m4) high; an islet, 13 feet (4^m0) high, lies about one cable westward of the southern part of the island.

The monastery tower southward of Miniés in line with the mill, mentioned on page 98, bearing 087°, leads southward of the shallow bank extending southward from Vardhiánoi.

A light is exhibited, at an elevation of 92 feet (28^m0), from a circular masonry tower 82 feet (25^m0) in height, situated near the south-eastern end of Vardhiánoi. *See views on chart.*

Anchorage.—There is good anchorage between Vardhiánoi shoal and Kalafáti reefs, about half a mile offshore, in depths of from 6 to 7 fathoms (11^m0 to 12^m8).

Coast.—Dangers.—Argostólion bay, described on page 100, is entered between Cape Áyios Yeóryios, page 98, and Cape Áyios Nikólaos, about 3½ miles south-eastward. *See view on chart.*

Cape Áyios Nikólaos (*Lat.* 38° 07' N., *Long.* 20° 30' E.) is low and shelving; the ruins of a small watch-tower stand a quarter of a mile south-eastward of the cape. Áyios Nikólaos islet, 12 feet (3^m7) high and rocky, lies about a cable north-westward of the cape; an above-water rock lies close off the south-western side of the islet. Foul ground extends about 3 cables westward and north-westward of Cape Áyios Nikólaos and a rock, with a depth of 3 feet (0^m9) over it, and which breaks, lies about 1½ cables west-south-westward of Áyios Nikólaos islet.

Cape Áyios Theodhóros light-structure, bearing 354°, and open westward of Cape Lardhigós, leads westward of the dangers off Áyios Nikólaos islet.

Áyios Nikólaos reefs, the southern end of which lies about 8 cables west-south-westward of Cape Áyios Nikólaos, extend about 1½ miles in a northerly direction and have a least depth of 6 fathoms (11^m0).

Cape Yerogómbos light-tower, bearing about 305°, and just open south-westward of Vardhiánoi light-tower, leads about a mile south-westward of Áyios Nikólaos reefs, and Argostólion signal station in line with Cape Lardhigós, bearing 015°, leads close westward of the reefs.

Chart 203.

Between Cape Áyios Nikólaos and Cape Ayía Pelayía (Pelagia), about 2 miles south-eastward, the coast is low and fringed with rocks. A reef, with depths of less than 6 feet (1^m8) over its outer end, extends about a mile south-eastward of Cape Ayía Pelayía; there are two islets on this reef, the inner, 37 feet (11^m3) high, and the outer, 30 feet (9^m1) high, at distances of 2½ and 3 cables, respectively, from the cape. Between the last-mentioned cape and Cape Liáka, about 2½ miles east-south-eastward, there is a bight, the coast of which is low and which is encumbered with sunken rocks, some of which are awash.

Dhía (Thio-nisi), a rocky islet, 116 feet (35^m4) high, with a monastery on its summit, lies about 1½ miles south-eastward of Cape Ayía Pelayía.

Charts 1600, 1800.

Chart 203.

and 6 cables offshore. Mizíthra, a rock, 51 feet (15^m5) high, lies about 3 cables north-westward of Dhía near the south-eastern end of a detached reef.

- 5 Cape Liáka is a low, shelving, sandstone point, rising gradually to cultivated land within; detached sunken rocks extend about a cable off the cape.

Dhanistís (Danisti), a barren rock, about 9 feet (2^m7) high, lies about half a mile south-south-westward of Cape Liáka; this rock has a white appearance and the sea sometimes breaks heavily on it. A vessel should not use the channel between the rock and the cape.

- 10 Lourda (Loortha) bay is entered between Cape Liáka and Cape Koróni (*Lat. 38° 05' N., Long. 20° 43' E.*), about 6 miles south-eastward. The shores of this bay are fringed by a bank, about half a mile wide, on which there are sunken rocks in places.

From Cape Liáka, for a distance of about 2½ miles, the coast consists of white clay cliffs, from 50 to 100 feet (15^m2 to 30^m5) high; thence there is a sandy beach, 1½ miles long, and the remainder of the coast, as far as Cape Koróni, consists of steep, cliffy points. With northerly and easterly winds very heavy squalls descend from Mount Aínos, which stands about 2 miles within the north-eastern side of the bay. With winds southward of east and west, a heavy swell sets into Lourda bay.

- Between Cape Koróni and Cape Kateliós (Cataleo), about 2½ miles east-south-eastward, the coast is bold and precipitous, with remarkable white cliffs from 200 to 300 feet (61^m0 to 91^m4) high; these cliffs are fringed by sunken rocks.

Between Cape Kateliós and Cape Moúnda, about 2 miles eastward, there is a bay with a sandy shore bordered by a shallow bank, on which there are sunken rocks in places. The cable connecting Cephalonia with Zante is landed about 1½ miles westward of Cape Moúnda. Small craft, with local knowledge, anchor off Kateliós (Cataleo), a village on the north-western side of the bay.

Charts 1676, 203.

- Cape Moúnda (*Lat. 38° 04' N., Long. 20° 48' E.*) is a bold, remarkable bluff, 100 feet (30^m5) high, its face being a steep clay cliff; the land for a distance of a mile northward of the cape is low and cultivated. See view facing this page.

Kákava reef fringes the south-eastern end of Cephalonia from about 1½ miles on either side of Cape Moúnda, and extends about 1½ miles south-eastward of it; there is a depth of 2½ fathoms (4^m1) near the south-eastern extreme of this reef. A detached 3-fathom (5^m5) patch lies on the south-western edge of the reef, about a mile south-south-eastward of Cape Moúnda.

- The western extremity of Átokos island, bearing 356°, and well open eastward of Cape Kápri, the eastern extremity of Cephalonia, leads clear of Kákava reef. Áyios Yeóryios castle in line with Cape Koróni, bearing about 300°, leads nearly a mile southward of Kákava reef.

Chart 1557.

Argostólion bay.—Aspect.—The entrance to Argostólion bay, which is described on page 99, leads into a considerable inlet, the northern end of which is known as Livádhi bay. See view on chart. The land on the eastern side of the bay is higher and steeper than that on the western side, and forms a ridge extending from Kotróni hill, 791 feet (241^m1) high, standing about 1½ miles north-eastward of

Charts 1800, 2158b.



C. Ayia Pelayia.

*Ayios Yedryios castle.
Cape Koróni.*

C. Moúnda.

*Mount Ainos,
bearing 309°.*

Cape Kípri.

Cophalonia from about 10½ miles south-eastward of Cape Moúnda
(Original dated 1912.)

Chart 1557.

Cape Áyios Nikólaos, to Cape Áyios Theodhóros (Theodoro), about 4 miles north-north-westward. The land on the western side is comparatively low and broken until it reaches the central ridges of that part of the island, $4\frac{1}{2}$ miles north-westward of Cape Áyios Yeóryios and about 3 miles from the western coast of the bay, where it attains an elevation of 1,478 feet (450^m5).

Controlled area.—See page 97.

Coast.—Dangers.—On the eastern side of the entrance of Argostólion bay there is a bight between Cape Áyios Nikólaos and Cape Lardhigós (Lardigo), about $2\frac{1}{2}$ miles north-westward; the coast of this bight is fringed by a shallow rocky bank, as much as $2\frac{1}{2}$ cables wide in places. There are some conspicuous white cliffs on the coast about $1\frac{1}{2}$ miles north-north-eastward of Cape Áyios Nikólaos, and Miniés, a village mentioned on page 98, is situated about three-quarters of a mile north-eastward of the same cape, with olive groves southward of it; among the trees there is a monastery with a conspicuous white tower.

Cape Lardhigós (*Lat. 38° 10' N., Long. 20° 29' E.*) is 143 feet (43^m6 high, and between it and Cape Áyios Theodhóros, about 2 miles north-north-westward, there is a bight fringed by a shallow bank on which there are sunken rocks close offshore in places. About midway between the two capes and from 2 to $3\frac{1}{2}$ cables offshore, there are two detached patches; the eastern patch has a least depth of 2 fathoms (3^m7) over it, and the western patch, a least depth of $2\frac{1}{2}$ fathoms (4^m6). The coast is backed by the ridge previously mentioned on page 100, and Argostólion signal station stands on one of the peaks of this ridge, which is 312 feet (95^m1) high, about a mile south-eastward of Cape Áyios Theodhóros.

Cape Áyios Theodhóros is low and rocky, and is fringed by a shallow, rocky bank which is as much as $1\frac{1}{2}$ cables wide off its north-western side, and 2 cables wide off its northern side. A detached sandbank, with a least depth of 4 fathoms (7^m3) over it, lies a quarter of a mile westward of the cape. Vardhiánoi light-tower, bearing 200°, and seen over the low part of Cape Áyios Yeóryios leads north-westward of the dangers off Cape Áyios Theodhóros. These dangers are covered by a *red* sector of Vardhiánoi island light between the bearings of 203° and 215°.

On the western side of Argostólion bay, Cape Áyios Yeóryios and the dangers extending from it are described on page 98. Between the cape and the entrance to Lixóurion (Lixuri) harbour, about $2\frac{1}{2}$ miles northward, the coast is low and fringed by above-water and sunken rocks; the coastal bank, over which there are uneven depths of less than 5 fathoms (9^m1), is about 3 cables wide.

Submarine cable.—A submarine cable, indicated on the chart by a pecked line, crosses Argostólion bay in a south-easterly direction, from a point about $1\frac{1}{2}$ miles northward of Cape Áyios Yeóryios.

Lights.—Light-buoy.—Buoys.—The light on Vardhiánoi island is described on page 99.

A light-buoy, exhibiting a *white flashing* light every $17\frac{1}{2}$ seconds, is moored about $2\frac{1}{2}$ cables north-north-westward of Cape Lardhigós.

Two spar buoys are moored off Cape Áyios Theodhóros, one about 4 cables westward and the other about $2\frac{1}{2}$ cables north-westward.



Cape Áyios Theodhóros light-structure.

Charts 203, 1800, 2158b.

Chart 1557.

A light is exhibited, at an elevation of 39 feet (11^m9), from a framework structure on a building surrounded by columns and resembling an ancient temple, 29 feet (8^m8) in height, situated on Cape Áyios Theodhórs. See view on page 101.

Lixóúríon.—Harbour.—Lights.—The town of Lixóúríon (Lixuri) which contained about 5,000 inhabitants, in 1945, is situated on the western side of Argostólion bay from 2 to 2½ miles northward of Cape Áyios Yeóryios. A mole projects from the southern end of the town 10 for about 1½ cables eastward and then about 1½ cables northward; about 2 cables northward of the root of this mole, another mole projects about 1½ cables eastward. These moles form a harbour for small craft. The western side of the harbour is quayed. A pier was under construction, in 1945, midway between the two moles.

15 It was reported, in 1940, that there were depths of 3½ fathoms (6^m4) at the entrance and also within the harbour of Lixóúríon.

Larger vessels anchor about 3 cables or more north-eastward of the entrance, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), mud.

20 A light (*Lat. 38° 12' N., Long. 20° 27' E.*) is exhibited, at an elevation of 13 feet (4^m0), from a stone column, 12 feet (3^m7) in height, situated on the head of the southern mole.



25 *Lixóúríon southern mole light-structure.*

A light is exhibited, at an elevation of 10 feet (3^m0), from the head of the northern mole.

Argostólion harbour.—This harbour lies on the eastern side of a promontory, of which Cape Áyios Theodhóros is the north-western extremity, and is entered between a point about 3 cables east-north-eastward of that cape and Cape Kókkinos Vrákhos, about three-quarters of a mile further north-north-eastward. Depths of less than 5 fathoms (9^m1) extend about 30 1½ cables off the south-western entrance point; from this point, for a distance of about 8½ cables, the south-western side of the harbour is fringed by a shallow bank about a cable wide. The head of the harbour is nearly all shallow and only suitable for small craft; it terminates in 35 Koútavos (Kutavos) lagoon, the north-western end of which is crossed by a bridge and a causeway.

It was reported, in 1940, that there were depths of from 3½ to 3½ fathoms (5^m9 to 6^m4) off the Customs house quay, about 4 cables north-westward of the obelisk on the causeway.

40 Conspicuous objects are, on the western side of the harbour, the prison and a statue; and on the south-eastern side, the church with its belfry painted blue and white, in the Greek cemetery, and the windmills near the Protestant cemetery.

On the western side of the harbour are the sea mills of Argostólion, 45 two channels in the rocky coast through which the sea pours; in 1927, the northern of these channels, situated about 3½ cables east-north-eastward of Cape Áyios Theodhóros light-structure, was working a mill and an ice-making plant with a red roof and a water-wheel of a reddish colour, plainly visible from seaward; the other had an inconsiderable 50 flow of water.

Light.—A light is exhibited, at an elevation of 13 feet (4^m0), from a white masonry obelisk, situated in a depth of 2½ fathoms (4^m6), about 1½ cables eastward of the northern end of the town.

Anchorage.—There is anchorage about 3 cables north-north-

Charts 203, 1800, 2158b.

Chart 1557.

westward of the light-structure, in a depth of 10 fathoms (18^m3), good holding ground ; vessels of moderate size may anchor further in, nearer the eastern shore. With strong southerly winds vessels should anchor under the lee of Cape Áyios Theodhóros (*Lat.* 38° 12' N., *Long.* 20° 29' E.). 5

There are some mooring buoys on the eastern side of the harbour.

There is, at times, a slight rise and fall of water and tidal streams set in and out, but irregularly.

Pilotage.—Pilotage is compulsory for all foreign merchant vessels. 10

Argostólion.—**Port facilities.**—This town, the capital of Cephalonia, lies on the western side of the head of Argostólion harbour.

The population numbered 8,293 in 1937.

There is frequent steamer communication with other Greek ports.

There is a general hospital with over 100 beds. 15

Lighters are available.

Water is procurable from a hydrant on the quay, but it is very hard.

Provisions are obtainable, but 10 days' notice is required when large quantities are needed.

Trade.—The chief exports are currants, wine, and olive oil, and the chief imports are grain, breadstuffs, cotton, linen and woollen fabrics, coffee, sugar, sulphur, dried and pickled fish, groceries, hides, leather, timber, iron and hardware, &c. 20

Magnetic observation spot.—See Appendix III, page 606.

Livádi bay.—This bay, mentioned on page 100, is entered between the northern mole of Lixóúrión harbour and Cape Kókkinos Vrákhos, page 102. Its eastern side is bold and steep-to ; the western side is low and sandy and fringed by a coastal bank, with depths of less than 5 fathoms (9^m1) over it, which is 3½ cables wide at the entrance and 4 cables wide about half a mile southward of Cape Samóli, which lies about 3 miles northward of Lixóúrión harbour. The marshes at the head of the bay are intersected by deep, wide creeks. Áyios Khristóforos (S. Christopher) church, a square building with a red roof and no belfry, situated on the eastern side of the bay, about 1½ miles northward of Cape Kókkinos Vrákhos, is conspicuous. Fársa church, a square blue building with a red roof, situated about 2½ cables east-north-eastward of Áyios Khristóforos church, can also be readily identified. 30

The bottom, in the middle of the bay westward of Áyios Khristóforos church, is of black mud and appears to be excellent holding ground.

Current.—Strong winds between north-west and north appear to drive the water out of the bay, and to cause a fall in the temperature of the water of as much as 6°. On the cessation of these winds, the water flows back into the bay, causing a north-going current of about one knot, which may last for 1½ days after a blow of 3 days' duration, and at the same time the temperature of the water returns to normal. 45

Charts 1557, 203.

Directions.—Approaching Argostólion bay from southward and westward, the summit of Mount Aínos (*Lat.* 38° 08' N., *Long.* 20° 41' E.), about 10 miles eastward of the entrance, may be seen in clear weather from a great distance. On nearing the bay, Áyios Yeóryios castle on a hill, 1,050 feet (320^m0) high, about 5½ miles westward of Mount Aínos, Dhía islet, with the monastery on its summit, and the white cliffs of the coast; all eastward of the entrance should be sighted ; on the western side is the light-tower on Vardhiánoi island. 50

Charts 203, 1800, 2158b.

Charts 1557, 203.

Approaching from westward, the white cliffs in the immediate vicinity of Áyios Nikólaos islet are conspicuous and appear as three; they make an excellent mark, and the southernmost cliff, which 5 appears wedge-shaped, if steered for bearing 063°, leads southward of all dangers until the entrance is open, when a northerly course may be steered into Argostólion bay. Entering between Áyios Nikólaos islet and Vardhiánoi island, all dangers are avoided by keeping in mid-channel.

- 10 From southward or eastward through Zante strait, a vessel should avoid Kákava reef, and passing Dhía islet and the coast westward of it at a prudent distance, enter in mid-channel as described above.

A vessel bound for Argostólion bay from northward, after passing the 15 south-western extremity of Cephalonia at a convenient distance, should keep Cape Yerogómbos bearing more than 322° until the tower of Miniés monastery bears 087° and is in line with a mill without sails on the crest of the first line of hills near Miniés, when she should steer for it until Vardhiánoi light-tower bears 334°, distant nearly 7 cables; then 20 steer 041° for Cape Lardhigós and proceed in mid-channel.

A vessel bound for Argostólion harbour should pass not less than 3 cables westward of Cape Áyios Theodhóros, and give the coast eastward of that cape a berth of a quarter of a mile. Proceeding into the harbour, the western shore must be given a sufficient berth.

- 25 The projecting points of the eastern shore of Livádhi bay in line with Cape Kókkinos Vrákhos, the red cliffs on the eastern side of the harbour, bearing 339°, leads up Argostólion harbour in depths of from 10 to 11 fathoms (18^m3 to 20^m1).

At night.—A vessel from north-westward, after passing Cape Yero- 30 gómbos, should keep its light bearing more than 328°, and should not approach within 2 miles of Vardhiánoi light until it bears 079°; then she should steer about 098°, and not get into depths of less than 13 fathoms (23^m8) in passing the light; when the light bears 334°, distant about three-quarters of a mile, a vessel should steer 041° for 35 about 2 miles, and then northward midway between the light on Cape Áyios Theodhóros and the light on the head of the southern mole of Lixourion harbour (*Lat.* 38° 12' N., *Long.* 20° 27' E.).

From south-westward, Vardhiánoi light should not be brought to bear less than 310° until within 1½ miles of it; from this position, 40 a vessel should steer about 010° for Cape Áyios Theodhóros light, and proceed as previously directed.

From south-eastward, Cape Yerogómbos light bearing about 305° and just open south-westward of Vardhiánoi light, leads south-westward of the reef extending from Cape Ayía Pelayía and of Áyios 45 Nikólaos reefs; a vessel should approach on this bearing to about 1½ miles from Vardhiánoi light, when Cape Áyios Theodhóros light will bear 010°; the latter may be steered for until Kalafáti reefs are passed; thence she should proceed as previously directed.

Chart 203.

- 50 **Western side of Cephalonia.**—Between Cape Yerogómbos, page 97, and Cape Athéras, about 11 miles north-north-eastward, the coast is composed of bold weather-worn cliffs indented by small sandy bays, with sunken rocks lying close offshore in places. The light on Cape Yerogómbos is described on page 98.

Charts 1800, 2158b.

Chart 203.

Cape Skiza (Kabbo), about $1\frac{1}{2}$ miles northward of Cape Yerogómbos, is a peculiar tongue of land projecting westward and, on the high cliffs, on its northern side there is a monastery.

Cape Ortholithiá lies $3\frac{1}{2}$ miles northward of Cape Skiza ; close off the former and off the coast for a distance of about a mile southward of it, there are several above-water and sunken rocks. Between this cape and Cape Kaláta, about a mile north-eastward, there is a bay which is open north-westward ; with a sandy beach at its head ; there is temporary anchorage in this bay for small vessels, with offshore winds. 10

From Cape Kaláta, the coast trends northward for a distance of $5\frac{1}{2}$ miles to Cape Athéras. There are several sunken rocks, some of which are as much as 2 cables offshore, from half a mile to $1\frac{1}{2}$ miles southward of Cape Athéras.

Cape Athéras (*Lat. $38^{\circ} 22' N.$, Long. $20^{\circ} 25' E.$*), the north-western 15 extremity of Cephalonia, is a bold prominent headland with steep white broken cliffs, on its western side.

Athéras (Aterra) bay, with steep rocky sides and a small sandy beach at its head, is entered between Cape Athéras and Cape Kakáta, about 2 miles eastward. There is an islet near the middle of the bay and 20 small vessels, with local knowledge, find shelter close under its lee, but the depths are considerable. As this bay is open northward, it is seldom visited.

Mírtos (Myrto) bay is entered between Cape Kakáta and the northern extremity of Ássos peninsula, about $4\frac{1}{2}$ miles east-north-eastward ; the 25 sides of the bay are steep and precipitous and there are sandy indentations at intervals. The bay affords no anchorage and caution should be observed in a vessel under sail not to get embayed ; the wind frequently falls to a calm under the high land, and a heavy swell rolls in from north-westward. 30

The ruins of the fortress of Ássos stand on the peninsula, which has two peaks and is connected to the mainland by a narrow, sandy isthmus. The fortress is surrounded on all sides by steep cliffs, 440 feet (134^m1) high. 30

Ássos harbour, a small inlet, is situated on the eastern side of the 35 peninsula ; the harbour affords shelter to small vessels, with local knowledge, during the summer months, but during winter it is seldom visited, being exposed to northerly winds which cause a heavy sea.

Outside the harbour there is temporary anchorage in depths of from 13 to 17 fathoms (23^m8 to 31^m1). 40

The customs and health duties are performed by the Chief of Police.

Between Ássos harbour and Cape Dhafnoúthi (Vlioti), about $5\frac{1}{2}$ miles northward, the coast consists of red cliffs from 50 to 150 feet (15^m2 to 45^m7) high, backed by cultivated ridges and indented by a few small bays. There are two islets and a few sunken rocks close inshore ; 45 with these exceptions, the coast is steep-to. There are several villages a short distance inland.

Cape Dhafnoúthi, the northern extremity of Cephalonia, is low, cliffy and steep-to. Cape Vliótiis (*Lat. $38^{\circ} 29' N.$, Long. $20^{\circ} 35' E.$*) lies about three-quarters of a mile eastward of Cape Dhafnoúthi. 50

Chart 1676.

Eastern side of Cephalonia.—Lights.—Cape Kápri, the eastern extremity of Cephalonia, lies about $3\frac{1}{2}$ miles north-north-eastward of Cape Moúnda, page 100. Cape Kápri is bold and steep-to ; a sharp-

Charts 1800, 2158b.

Chart 1676.

topped hill, 543 feet (165^m5) high and partially covered with stunted trees, rises immediately over it. The coast between Cape Kápri and Cape Limnióni (Limiona), about 1½ miles north-north-westward is steep-to; thence to Cape Prónos (Sarakinico), about 1½ miles further north-north-westward, the coast is fringed by a bank, 2 cables wide, on which there are sunken rocks.

A light (*Lat.* 38° 09' N., *Long.* 20° 49' E.) is exhibited, at an elevation of 59 feet (18^m0), on Cape Prónos.

10 *Chart 203.*

Prónos bay, the shore of which is mostly shingle, is entered between Cape Prónos and Cape Átros, about 1½ miles north-westward. At Port Póros, situated in the southern part of the bay, there is a small mole; small vessels anchor occasionally, in depths of from 13 to 23 feet (4^m0 to 7^m0), off this port; an easterly wind causes a heavy sea. Póros gorge, which is remarkable and from 300 to 400 feet (91^m4 to 121^m9) high, is the outlet for the mountain torrents during the winter and is situated in the southern part of Prónos bay.

Cape Agriósiko (Grosso), about 5 miles north-north-westward of Cape Átros, is a steep and remarkable, perpendicular, rocky cliff, from 100 to 130 feet (30^m5 to 39^m6) high, rising abruptly from the sea; Cape Agriliá (Agrilios), about 1½ miles further north-north-westward, is steep and rocky, with a knob on it.

Cape Dhikhália (Dekalia), the north-western extremity of a promontory, the north-eastern extremity of which is called Mítika by the Greeks, lies about 1½ miles north-westward of Cape Agriliá. Cape Dhikhália is a bold, bare, rocky headland, easily identified by a small and remarkable peak over it, about 525 feet (160^m0) high, which is partly covered with bushes.

Andísamos (Anti Samos) bay is entered between Cape Andísamos, about 4 cables south-eastward of Cape Dhikhália and a point about three-quarters of a mile further south-eastward. A vessel might anchor in this bay in depths of from 10 to 12 fathoms (18^m3 to 21^m9), about 2 cables from the beach at its head, but as it is open north-eastward, from which quarter heavy squalls at times prevail, it can only be used as a temporary anchorage during summer.

A light (*Lat.* 38° 17' N., *Long.* 20° 41' E.) is exhibited, at an elevation of 36 feet (11^m0), from a masonry beacon on two iron columns, 29 feet (8^m8) in height, on Cape Dhikhália.

40 **ITHACA STRAIT.—Caution.—Lights.**—Ithaca strait separates the islands of Cephalonia and Ithaca; the depths in mid-channel are considerable and the sides are steep-to except for a rocky fringe here and there and Dhaskalió (Deskalió) islet, described on page 107.

A vessel under sail should not enter Ithaca strait except with a fair wind, as the depths are too great for anchoring should it fall calm, the currents are uncertain, and, at times, terrific squalls blow from the neighbouring high land.

Ithaca strait is entered, from south-eastward, between Cape Dhikhália and Cape Áyios Andréas, the western entrance point of Áyios Andréas bay and the southern extremity of the island of Ithaca, about 2½ miles east-north-eastward.

On the western side of Ithaca strait, between Cape Dhikhália and Cape Agriósiko, 3 miles north-westward, there is a large indentation;

Charts 1800, 2158b.

Chart 203.

Sámi (Samos) bay is situated in the southern part, and Ayía Evfímia (Pílaros) harbour, in the north-western part of this indentation. Cape Agriósiko is the bluff termination of a spur of the mountain range immediately over it and is composed of conspicuous white cliffs. 5

On the eastern side of the strait, the south-western side of Ithaca, between Cape Áyios Andréas, and the southern entrance point of a small bay, about $3\frac{1}{4}$ miles north-north-westward, is steep-to and backed by high land.

Piso Aetós (Opis Aito) roadstead is situated in this small bay, which 10 is a quarter of a mile wide at its entrance, and has a sandy beach. The submarine cable from Sámi bay is landed in this vicinity.

A light, known as Piso Aetós, is exhibited, at an elevation of 65 feet (19^m8), from a white beacon on a masonry base, 16 feet (4^m9) in height, situated on a point about a mile west-north-westward of the southern 15 entrance point of the small bay just mentioned.

On the western side of Ithaca strait, between Cape Agriósiko, page 106, and Cape Fiskárdo, about 9 miles north-north-westward, the coast is indented with coves which are frequented by small vessels, with local knowledge. 20

Besides the lighthouse on Cape Fiskárdo there is a disused lighthouse, a round tower, about 30 feet (9^m1) high; on the slight rise within the cape there is a square ruin, which is conspicuous from southward.

Fiskárdo (Guiscardo) bay lies between Cape Fiskárdo and a point about 4 cables southward. 25

A light (*Lat.* $38^{\circ} 28' N.$, *Long.* $20^{\circ} 36' E.$) is exhibited, at an elevation of 90 feet (27^m4), from a square masonry tower, 46 feet (14^m0) in height, situated three-quarters of a cable within Cape Fiskárdo. The light-house is not conspicuous on account of the background.

Dhaskalió, an islet, 10 feet (3^m0) high and of a reddish colour, lies 30 about $1\frac{1}{2}$ miles south-south-eastward of Cape Fiskárdo and 3 cables off the western side of Ithaca strait. The ruins of an old tower stand on the islet. A bank, with depths of less than 5 fathoms (9^m1) over it, extends a short distance north-north-westward and south-south-eastward of Dhaskalió. 35

On the eastern side of Ithaca strait, the coast between Píso Aetós lighthouse and the southern entrance point of Pólis harbour, about 5 miles north-north-westward, is backed by high land. From $2\frac{1}{4}$ to $3\frac{1}{4}$ miles northward of the lighthouse, the coast is fringed by a narrow bank, on the northern end of which there are an above-water rock and 40 a sunken rock; another above-water rock lies close offshore about three-quarters of a mile further northward; with these exceptions the coast is steep-to.

The entrance of Pólis harbour, which is open south-south-westward, is about a cable wide. There is a depth of 17 fathoms (31^m1) in the 45 middle of the harbour, but small vessels anchor near the shore. The hill on the northern side, overlooking the harbour, is 870 feet (265^m2) high.

Cape Batístas (Oxoi) lies about $2\frac{1}{4}$ miles north-north-westward of the western entrance point of Pólis harbour, the coast between being steep-to and backed by high land.

Cape Argastariés, about 2 cables east-north-eastward of Cape Batístas, is the northern extremity of a promontory, and is the eastern entrance point at the northern end of Ithaca strait. The northern end

Chart 203.

of this promontory is high and bold, and, from a distance westward, is seen before the land near Capes Dhafnoúdhi and Vlióti's, page 105, which lie on the western side of the northern entrance of Ithaca strait, and are much less elevated; when seen from westward the northern end of the promontory appears as a large round headland with an old tower on its summit. The depths in the vicinity are considerable and the current is perceptible.

On the north-western side of Ithaca strait, the coast is indented between Cape Fiskárho and Cape Vlióti's, about $1\frac{1}{4}$ miles north-westward.

A vessel from north-westward, bound through Ithaca strait will first sight the high land of Levkás, and then Cape Pídhima tís Sappoús (Sappho's leap), the remarkable white patch 2 miles northward of Cape Doukáton, the south-western extremity of that island; next, the bold headland on the eastern side of the northern entrance of the strait, and finally, the northern extremity of Cephalonía, which is comparatively low.

Sámi bay.—Anchorage.—Light.—Sámi bay is sheltered from all except northerly winds and even with these the sea is not dangerous.

At the head of the bay, the bottom is mud and sand and the holding ground is good. Vessels may anchor in depths of from 12 to 15 fathoms (21^m9 to 27^m4); a suitable berth for a vessel, 200 feet (61^m0) long, is in a depth of 12 fathoms (21^m9), with the light on the mole head bearing 131° , distant $1\frac{1}{4}$ cables; large vessels should anchor further out.

A small mole projects in a westerly direction from near a large house in the village of Sámi, and is used by small craft. Vessels drawing 10 feet (3^m0) can moor with their sterns secured to the town quay or mole (*Lat.* $38^\circ 15' N.$, *Long.* $20^\circ 40' E.$).

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column on a hut, situated on the head of the mole at Sámi.

During strong winds heavy squalls descend from the high land.

The village of Sámi (Samos) is in the south-eastern angle of the bay. On the summit of a hill eastward of it are the ruins of an ancient city. An extensive cultivated plain extends southward from the head of the bay.

The cable connecting Cephalonia with Ithaca is landed in the eastern part of the bay.

Ayía Evfimía harbour.—Light.—Ayía Evfimía harbour affords anchorage for small vessels, with local knowledge, in depths of from 2 to 8 fathoms (3^m7 to 14^m6). There is a mole and a quay here. It is rarely visited in winter, being exposed to north-easterly and south-easterly winds which cause a heavy swell. Violent squalls also descend the deep valley extending westward from the harbour.

A light is exhibited, at an elevation of 24 feet (7^m3), from a white square column, situated on the molehead of Ayía Evfimía harbour.

Fiskárho bay.—Anchorage.—In the north-western corner of this bay there is an inlet receding in a north-westerly direction, which is a cable wide in its narrowest part. There is a projection from the western side abreast the customs house, within which there is a small harbour, with depths, in 1937, of from $3\frac{1}{2}$ to 5 fathoms (6^m9 to 9^m1), good holding ground, but the space is limited. There is a quay to which small vessels can secure. The village of Fiskárho is situated on the southern side of the bay.

Chart 203.

In westerly and north-westerly gales, vessels can find shelter in Fiskárdo bay, in depths of from 11 to 14 fathoms (20^m1 to 25^m6), with the lighthouse bearing about 006°, distant 1½ cables; there is room for a large vessel to moor.

5

ITHACA.—General remarks.—Ithaca, called Itháki by the Greeks, is mountainous, and nearly divided into two parts by the Gulf of Mólo, on its eastern side; the northern part attains an elevation of 2,572 feet (783^m9) in Mount Anóyi (Korifi), and the southern part, 2,133 feet (650^m1) in Mount Áyios Stéfanos (Stefano).

10

In general the coast is rocky, with several indentations which afford shelter to local craft.

Currants, wine, and a little oil, are its only exports.

The submarine cable from Levkás is landed at Cape Méliissa (Marmaka).

15

Southern and south-eastern sides of Ithaca.—Light.—The western side of Ithaca is described under Ithaca strait, pages 106-108.

Áyios Andréas bay is situated on the southern side of Ithaca close eastward of Cape Áyios Andréas, page 106. The entrance is a cable wide and there is a sandy beach at its head, off which small vessels, with local knowledge, anchor. There are depths of 30 fathoms (54^m9) in the fairway of its entrance, decreasing to 8 and 3 fathoms (14^m6 and 5^m5) near its head.

20

Cape Áyios Ioánnis (Iganni), the south-eastern extremity of Ithaca, lies about 2½ miles east-north-eastward of Cape Áyios Andréas.

25

A light (*Lat.* 38° 19' N., *Long.* 20° 47' E.) is exhibited, at an elevation of 39 feet (11^m9), from a white iron obelisk on a concrete base, 16 feet (4^m9) in height, on Cape Áyios Ioánnis.

Between Cape Áyios Ioánnis and Cape Sarakíniko, 2½ miles northward, there is a bight, the coast of which is indented. Perapigádhi (Parapigadi), an islet, lies about 1½ miles north-westward of Cape Áyios Ioánnis, separated from the coast by Balóula strait, about a cable wide, in which there is a depth of 2 fathoms (3^m7); small vessels with local knowledge anchor here.

30

Sarakíniko bay, situated on the southern side of the cape of that name, is open south-eastward and affords no anchorage. Between Cape Sarakíniko and Cape Skíno, 2½ miles north-westward, the coast is indented.

35

Charts 1620, plan of Gulf of Molo and Port Vathi, 203.

Gulf of Mólo.—Light.—This gulf, called Kólpos Mólou by the Greeks, is entered between Cape Skíno and Cape Áyios Ilías (St. Elias), about 2½ miles northward. Cape Skíno (*Lat.* 38° 23' N., *Long.* 20° 44' E.) is the north-western extremity of a tongue of land consisting of a chain of low hills; half a mile east-south-eastward of the cape there is an above-water rock lying, close offshore, on a rocky bank which extends about half a cable outside the rock. Cape Áyios Ilías is steep-to; near it and low down there is a white chapel and further in, on the high land, a windmill. From Cape Áyios Ilías, the western side of the gulf is high and steep-to, rising in ridges with deep ravines, and trends in a south-south-westerly direction for the distance of about 4½ miles to the head of the gulf. See view on chart 1620.

45

50

Chart 1620, plan of Gulf of Molo and Port Vathi.

On the south-eastern side of the gulf, Skíno bay is entered between

Charts 1676, 1800, 2158b.

Chart 1620, plan of Gulf of Molo and Port Vathi.

Cape Skíno and Cape Néra, half a mile south-westward. At the head of Skíno bay, Níon (Neios) cove, which is sandy, is situated in the north-north-eastern part, and another sandy cove in the south-western part.

- 5 The hill on the south-western side of the bay, about 4 cables south-south-eastward of Cape Néra, is 553 feet (168^m6) high.

Cape Áyios Andréas (Andrea) lies about 2½ cables south-westward of Cape Néra (*Lat.* 38° 23' N., *Long.* 20° 45' E.).

- 10 A light is exhibited from a square lantern on the summit of a ruin, which has the appearance of a white cairn on Cape Áyios Andréas. A white house, close to the light, is conspicuous.

- The channel leading to Vathí harbour, described below, is entered between Cape Kéfalos (Kephalo), about 3 cables southward of Cape Áyios Andréas, and the western extremity of a projection, about 15 4 cables further southward. Dhexiá (Dexia) bay is entered between the above-mentioned projection and a point about 1½ cables south-westward.

- Skartsoúmbo (Katzurbo-nisi), a rocky islet, lies in the approach to Dhexiá bay, with its northern extremity about a quarter of a mile 20 south-westward of Cape Kéfalos.

- Vathí harbour.—Light.**—This is a small landlocked harbour, approached by a channel, previously mentioned, about half a mile long and 1½ cables wide in its narrowest part, the entrance to which can easily be distinguished by the lighthouse on Cape Áyios Andréas, on the 25 northern side, and Skartsoúmbo islet, on the southern side. The bottom of the harbour consists of mud; towards its head, the depths decrease rapidly.

- An islet, on which there is a prison, lies near the extremity of a shallow bank which extends about 1½ cables northward from the south- 30 western side of the harbour.

There are bollards along the sea front from the main landing jetty to a position southward of the islet, and thence there are ring bolts on the shore of the bay westward of the islet.

- A light is exhibited, at an elevation of 16 feet (4^m9), from a stone 35 column, 8 feet (2^m4) in height, situated on the northern corner of the prison.

A jetty, with a depth of 3 feet (0^m9) alongside, extends from the eastern side of the harbour, about 2 cables eastward of the prison.

- A white monument, about 18 feet (5^m5) in height, surmounted by 40 a bronze bust, stands on this jetty.

The main landing jetty, situated near the police, health, and post offices, on the western side of the head of the harbour, has a depth of 6 feet (1^m8) alongside it.

- The town of Vathí, around the southern and south-eastern parts of 45 the harbour, consists of white houses; the population, in 1945, was 3,500. The principal part of the town is not so much above sea-level, but on the western side many houses stand on the slopes of the hill. South-eastward of the town there is cultivated ground.

- Anchorage.**—Anchorage is reserved for men-of-war in the bay 50 westward of the islet with a prison on it; it was recommended by the Captain of the Port, in 1912, as being the position best sheltered from heavy squalls from between south-west and north-west. There is a depth of 6 fathoms (11^m0), mud, within 25 yards (22^m9) of the shore in this bay in many places. Vessels anchored here should be secured by

Chart 1620, plan of Gulf of Molo and Port Vathi.

the stern to the ring bolts previously mentioned ; the holding ground is good.

There is anchorage north-eastward of the islet (*Lat. 38° 22' N., Long. 20° 43' E.*), in depths of from 13 to 15 fathoms (23^m8 to 27^m4) ; also in depths of 9 or 10 fathoms (16^m5 or 18^m3), about three-quarters of a cable eastward, but this position is only half a cable from the bank, with depths of less than 5 fathoms (9^m1) over it, which extends from both sides of the harbour. Small vessels anchor closer in, in depths of 3 or 4 fathoms (5^m5 or 7^m3). At times, there are very heavy north-westerly squalls, for which a vessel should be prepared.

Chart 203.

North-eastern side of Ithaca.—Danger.—Cape Koutsoumbos lies about a mile northward of Cape Áyios Ilías, page 109. Kíonion (Kioni) harbour, which is clear of danger, is entered between a point, situated a short distance northward of Cape Koutsoumbos and a point, about 3 cables further north-north-westward. On the southern entrance point there were two windmills, in 1866, and on the northern side there is a remarkable hill. The village of Kíonion is situated at the head of the harbour ; close off the village there are depths of from 2 to 4 fathoms (3^m7 to 7^m3) ; in the middle of the harbour, the depths are considerable.

Frikes bay is entered between Cape Mavróna, situated about a mile north-north-westward of the southern entrance point of Kíonion harbour, and Cape Áyios Nikólaos, about 1½ miles further north-north-westward. The bay affords anchorage in depths of from 2 to 3 fathoms (3^m7 to 5^m5) ; at the head of the bay is the village of Frikes.

A detached shoal, with a depth of 5 fathoms (9^m1) over it, lies in the south-eastern approach to Frikes bay, about 4 cables south-eastward of Cape Mavróna and about 2 cables offshore.

The sides of Frikes bay are indented and some of the small inlets afford anchorage for small vessels, with local knowledge. The depths are considerable a short distance offshore.

Áyios Nikólaos roadstead, where there is a sandy beach, is situated on the southern side of the cape of that name ; it is fronted by an islet and two sunken rocks. The entrance is along by the northern side of Frikes bay and is about a cable wide ; within, there is anchorage for small vessels, with local knowledge, in a depth of 5 fathoms (9^m1).

Between Cape Áyios Nikólaos and Cape Mélissa (Marmaka), the northern extremity of Ithaca, about 1½ miles north-westward, the coast is indented and is high and steep-to. Cape Mélissa is a sharp projecting headland, clear of dangers and steep-to ; on its eastern side, there is a cove.

Light.—A light (*Lat. 38° 29' N., Long. 20° 41' E.*) is exhibited, at an elevation of 46 feet (14^m0), from a white iron beacon on a square hut, 20 feet (6^m1) in height, situated on Cape Áyios Nikólaos.

North-western side of Ithaca.—Afáles (Aphales) bay, which is open north-westward, is entered on the north-western side of Ithaca, between Cape Argastariés, page 107, and Cape Mélissa, about 2 miles north-eastward. On the eastern side of the bay there is a steep cliff and at its head there is a sandy beach.

Chart 3496.

COAST.—Oxiá bay is entered between a point about three-quarters of

Charts 203, 1800, 2158b.

Chart 3496.

a mile eastward of the north-eastern extremity of Oxiá island, page 74, and the southern entrance point of the River Akhelóös, about $1\frac{1}{2}$ miles north-westward. H.M.S. *Leander* anchored in this bay, in 1904, in a depth of 15 fathoms (27^m4), sand, with the north-western extremity of Oxiá island bearing 236° , and the eastern extremity of that island bearing 196° . The anchorage was found to be easy of access by night. In strong winds, squalls from the high land are extremely heavy.

The northern shore of the bay is fringed by a bank, with depths of less than 3 fathoms (5^m5) over it, which extends as much as $3\frac{1}{2}$ cables offshore in places; the outer edge of this bank is steep-to. The best landing place is at some rocks on the eastern side of the head of the bay.

Navigation is prohibited in the southern part of the bay, *see* page 74.

The Akhelóös, the largest river in Greece, flows into the sea through the extensive plain between the base of Mount Koutsouláris, page 77, and Dhióni peninsula, the southern extremity of which (*Lat.* $38^\circ 22' N.$, *Long.* $21^\circ 06' E.$) lies about 4 miles north-westward of the summit of that mountain. The river averages 100 yards (91^m4) in breadth for 30 miles from its mouth, with depths of from $1\frac{1}{2}$ to 4 fathoms (2^m7 to 7^m3), but has a depth of only about 2 feet (0^m6) on its bar. At its mouth there is a low grassy island forming two narrow entrances with sandbanks nearly awash on either side; the northern entrance is that principally used, though sometimes the southern entrance is the deeper. There is a ferry at Katokhi, a village, about 8 miles from the mouth.

The river in winter inundates the whole plain near the sea, bringing down a large quantity of deposit. These floods as well as the receding of the waters are sometimes very sudden.

The bar, which breaks with south-westerly winds, is shallow half a mile from the entrance, and its outer edge is steep-to. At times the sea is discoloured nearly 2 miles offshore, the line of discoloration being very marked.

From northward, the northern extremity of Prómonas island in line with the southern extremity of Mákri island, bearing 304° , leads 4 cables south-westward of the outer edge of the bar.

Dhióni bay lies between the mouth of the River Akhelóös and the southern end of Dhióni peninsula. The coast at the head of the bay is flat and within it there is an extensive marshy plain covered with reeds and intersected by creeks. H.M.S. *Goldfinch*, when resorting to this anchorage on several occasions in 1904, found a heavy breaking swell to rise quickly with westerly and north-westerly winds, in a depth of 12 fathoms (21^m9), Mákri island affording but little shelter. These winds, of moderate strength, may be expected in the summer to set in daily by mid-day, continuing till near midnight.

Dhióni peninsula is hilly, rocky, and 288 feet (87^m8) high; it is connected to the mainland by a neck of sand and mud.

Its western side is steep-to and on its eastern side there is a fishery.

Chart 1939.

Petalás harbour, described on page 116, is entered between the northern extremity of Dhióni peninsula and Cape Áspro, the southern extremity of Petalás island, half a mile northward.

Chart 3496.

EKHINÁDHEIS ISLANDS.—These islands lie off the coast in the north-western approach to the Gulf of Patras. They consist of two

Charts 1676, 203, 1800, 2158b.

Chart 3496.

main groups, with a group of four islets and an above-water rock between; the Kourzolárie islands, consisting of Oxiá, Kounéli, Mákri and Prómonas, form the southern group and the Dhragonéra islands, consisting of eleven islands and a number of above-water rocks, form the northern group; Petalás, described below, is also one of the Ekhinádhès islands.

Kourzolárie islands.—Oxiá, the south-easternmost of the Kourzolárie (Echinades) islands, is described on page 77.

Kounéli, an islet, 83 feet (25^m3) high, steep and rocky, lies about 1½ miles south-westward of the southern extremity of Dhióni peninsula, page 112.

Mákri island lies with its south-eastern end connected to Kounéli by a narrow, rocky ledge, over which the depths are uneven, rendering the channel between them unsafe except for small craft. A shoal, with a depth of 1½ fathoms (2^m3) over it, extends from the north-western extremity of Mákri. There is a conspicuous conical hill, 417 feet (127^m1) high, on Mákri about half a mile south-eastward of its north-western extremity.

Prómonas (Vromóna), a flat-topped island, 472 feet (143^m9) high at its southern part, lies with its northern extremity about 1½ miles west-north-westward of the north-western extremity of Mákri; the island is partly cultivated.

Lights.—The light on Oxiá island is described on page 78.

A light is exhibited, at an elevation of 91 feet (27^m7), from a white iron tower on a concrete base, 9 feet (2^m7) in height, on the summit of Kounéli islet.

Charts 1939, 3496.

Middle group.—**Danger.**—Módhi (Stamothi), the southernmost islet of the middle group, is 229 feet (69^m8) high and lies about 3 miles north-north-eastward of Prómonas.

Apása, an islet, 55 feet (16^m8) high, and Sorós, an islet, 100 feet (30^m5) high, joined together by a sunken ridge, lie about 2 and 4 cables, respectively, northward of Módhi. Grávaris (Cravaris), an islet, 80 feet (24^m4) high, the northernmost and smallest of the group, and shaped like a haycock, lies about 2 cables further northward.

The depths in mid-channel between Módhi and Apása, and between Sorós and Grávaris are considerable.

Chart 1939.

Naváyon (Wreck), a reef on which there is an above-water rock, lies about a mile east-north-eastward of Grávaris, a vessel should not approach the rock within 1½ cables.

Beacon.—A beacon, consisting of a truncated cone surmounted by two balls, painted black and white, and having an elevation of 18 feet (5^m5), stands on Naváyon.

Petalás island.—**Beacon.**—**Light.**—Cape Áspro (*Lat.* 38° 23' N., *Long.* 21° 07' E.), the southern extremity of Petalás, the easternmost of the Ekhinádhès islands, is mentioned on page 112. The island is hilly, rocky, and 832 feet (253^m6) high; there are a few small patches of cultivated ground. Its western coast is steep and rocky, with considerable depths close offshore. The eastern side is also steep and, about the centre, precipitous, the cliffs being 60 feet (18^m3) high, with several caves. Shallow, sandy flats, generally covered with dark weed, separate Petalás from the mainland, and are the site of numerous

Charts 1676, 203, 1800, 2158b.

Charts 1939, 3496.

fisheries. Close along the eastern side of this island, there is a boat channel with a depth of about 3 feet (0^m9).

A white stone beacon stands on Cape Áspro.

- 5 A light is exhibited, at an elevation of 39 feet (11^m9), from a white iron column on a hut, 19 feet (5^m8) in height, on Cape Áspro.

Dangers.—Xeropoúla (Shag rock), a reef with a rock, 6 feet (1^m8) high, on it, lies a quarter of a mile west-north-westward of the northern extremity of Petalás, with depths of 15 fathoms (27^m4) in the fairway between. Depths of less than 5 fathoms (9^m1) extends half a cable north-westward of the above-water rock.

- Sentry bank, with a depth of 10 fathoms (18^m3) over it, lies about 3 cables west-north-westward of Xeropoúla. It should be avoided by
15 a vessel of deep draught, as although the bank was carefully examined, the sudden manner in which the head rises from the bottom points to the possibility of the existence of a pinnacle which sounding has failed to discover. When passing this locality, the northern peak of Dhióni peninsula, bearing 155°, and open south-westward of the south-western
20 side of Petalás, leads south-westward of Sentry bank.

The summit of Cape Pogoniá (Glosa Pogonias) in line with the eastern side of Pondikó island, bearing 001°, leads midway between Sentry bank and Xeropoúla.

Chart 3496.

- 25 **Dhragonéra islands.**—The Dhragonéra (Dragonera) islands lie in the approach to Astakós (Dragamesti) bay, which they shelter from south-westerly winds and sea. They are generally steep-to with navigable channels between. The islands are covered with large stones and scrub, with a few wild olive trees; they are very hilly and rise
30 steeply from the sea; cultivation is carried on during some months of the year, in patches, on all but the smallest islands.

Chart 1939.

- Pondikó, the south-easternmost of this group, is 215 feet (65^m5) high and lies with its south-eastern extremity about a mile north-north-
35 westward of the northern extremity of Petalás island (*Lat. 38° 26' N., Long. 21° 06' E.*). The south-eastern and eastern extremities of the island are foul to the distance of about a cable offshore; the rock on Xeropoúla, bearing 180°, and just open westward of the western extremity of Petalás, leads eastward of these dangers.

- 40 The north-western end of Pondikó is also foul for the distance of one cable offshore, and when passing this locality the beacon on Naváyon reef should be kept bearing 203° and open south-eastward of the south-eastern extremity of Prómonas.

- Prováti, an island, lies about 4 cables north-westward of Pondikó;
45 the channel between them is the most direct for vessels bound for Astakós, page 118, from southward.

Tsákalo (Chakolonisi), an island, 60 feet (18^m3) high, lies about 1½ cables off the western side of Prováti.

- Kárho (Carlónisi), an island, 260 feet (79^m2) high, lies north-north-
50 westward of Prováti, separated by Dhiáporos (Thiaporí) strait, about half a cable wide, in the fairway of which there are depths of 9 fathoms (16^m5). A bank, with depths of less than 5 fathoms (9^m1) over it, extends three-quarters of a cable from the western side of Kárho.

Day rock is described on page 115.

Charts 3496, 1676, 203, 1800, 2158b.

Charts 1939, 3496.

Dhragonéra (Dragonera), the largest of the group, is 422 feet (128^m₆) high and lies westward of Kárló, separated by a channel about 3 cables wide.

Southward of Dhragonéra lie the islets of Fílippos and Pistrós; the former is 93 feet (28^m₃) high and is connected to the western part of the southern side of Dhragonéra by a narrow shallow ridge. Two above-water rocks lie on a spit which extends about 2 cables south-south-westward of Fílippos; Oxópetra, the northern of these rocks is 27 feet (8^m₂) high. Pistrós is 145 feet (44^m₂) high and has two large trees near its summit. Two rocks, 3 feet (0^m₉) high, with a depth of 2 fathoms (3^m₇) close north-westward of them, lie about half a cable off the north-western side, and a rock, 2 feet (0^m₆) high, lies close off the north-eastern side of this islet.

Kalóyiros (Kaloyeros), an islet, on the north-eastern side of Dhragonéra, is separated from it by a channel about a cable wide between the banks on either side. A spit, with a depth of 5½ fathoms (10^m₁) over its outer end, extends about half a cable from the southern extremity of Kalóyiros (*Lat. 38° 29' N., Long. 21° 03' E.*).

Sofiá (Sophia), an islet, 145 feet (44^m₂) high, with Lambrínós another islet, 205 feet (62^m₅) high, connected to its southern end by a narrow shallow ridge, lies with its northern extremity about 3 cables west-south-westward of the north-western extremity of Dhragonéra.

The fairway of the channel between Dhragonéra and Pistrós, on its western side, and Tsákalo, Prováti, and Kárló, on its eastern side, is clear of dangers. In using this channel, a vessel should keep the south-eastern extremity of Prómonas bearing 193° and just open westward of Módhi.

There is a narrow channel, leading northward, eastward of Lambrínós and Sofiá, passing westward of Pistrós, and the detached rocks off it, all of which are above water, and between Fílippos and Lambrínós; all the other channels between the islets just mentioned are obstructed by shoals.

Dhragonéra and Kalóyiros form the southern side of the northern passage into Astakós bay.

Práso, an islet, 42 feet (12^m₈) high and composed of rocks and boulders, is the westernmost of the Dhragonéra islands. A narrow, rocky ridge, terminating in Práso reef, where there is a depth of 5 fathoms (9^m₁), extends about three-quarters of a mile north-north-eastward of Práso; this ridge is steep-to. With the exception of the north-eastern side, the other sides of Práso may be approached with safety to the distance of a quarter of a mile.

Dangers.—Caution.—Day rock, with a depth of 4½ fathoms (7^m₈) over it, lies about 7 cables eastward of Kárló. The summit of Oxiá island in line with the eastern extremity of Pondikó, bearing 169°, leads 2 cables south-eastward of Day rock. See view on chart 1939. The eastern extremity of Módhi in line with the eastern extremity of Prováti, bearing 207°, leads about half a mile north-westward of Day rock. Módhi should not be visible when passing westward of Day rock. The rock lies in the white sector of Kalóyiros light between the bearings of 298° and 316°.

Chart 3496.

Davy and Grant reefs, each with a depth of 7 fathoms (12^m₈) over it, are situated 2 and 8 cables respectively, north-north-westward of the

Charts 1676, 203, 1800, 2158b.

Chart 3496.

northern end of Dhragonéra. There is a passage about half a mile wide, in which the depths are considerable, between them. The eastern extremities of Kalóyiros and Pondikó in line, bearing 139° , leads north-eastward, and the western extremities of Sofiá and Prómonas in line, bearing 184° , leads westward of these reefs.

Práso reef is described on page 115.

Konstandía and Sevastaí (Venerable) banks comprise some small, detached, rocky patches situated from 2 to 3 miles north-north-westward of Práso (*Lat. $38^\circ 29' N.$, Long. $20^\circ 59' E.$*); they stand on a bank with less than 30 fathoms (54^m9) over it. Custance shoal, with a depth of 7 fathoms (12^m8) over it, is situated on Konstandía bank, about $2\frac{1}{2}$ miles north-north-westward of Práso. Sevastaí banks, with depths of 11 and 12 fathoms (20^m1 and 21^m9) over them, the north-western-most patches, lie from 3 to 5 cables north-westward of Custance shoal.

Much time was devoted to a careful examination of this locality in 1904, yet, from the sudden manner in which all these heads rise amidst the greater depths surrounding them, it is possible that other heads may exist, and it would be prudent for deep-draught vessels to avoid this area. There is a clear channel over a mile wide between the southern-most of these patches and Práso reef.

Oxiá peak in line with Práso islet, bearing 147° , leads south-westward, and the western extremities of Móðhi and Lambrinós islands in line, bearing 162° , leads north-eastward of Konstandía and Sevastaí banks.

Chart 1939.

Lights.—The light on Cape Áspro is described on page 114.

A light is exhibited, at an elevation of 36 feet (11^m0), from a white iron pyramidal structure, on a masonry base, 19 feet (5^m8) in height, on the western extremity of Pondikó.

A light (*Lat. $38^\circ 29' N.$, Long. $21^\circ 03' E.$*) is exhibited, at an elevation of 138 feet (42^m1), from a white iron tower on a concrete base, 13 feet (4^m0) in height, on the north-eastern peak of Kalóyiros.

COAST.—**Petalás harbour.**—The entrance to Petalás harbour is described on page 112. The harbour lies between the southern part of Petalás island and the coast under the Khounovína (Kunevima) hills, the summit of which, elevated 545 feet (166^m1), stands about $1\frac{1}{2}$ miles north-eastward of Cape Áspro.

Khounovína hills rise abruptly from the plain with well marked extremities in the characteristic manner of all hilly tracts in the delta of the Akhelóös river.

The anchorage is good and well sheltered, but is not available for vessels drawing more than 16 feet (4^m9). Vessels of deeper draught should anchor just inside the entrance, which is opened westward.

Petalás harbour is frequented by vessels engaged in the timber trade. The anchorage being situated near the entrance to the Gulf of Patras is a refuge for sailing vessels when meeting south-westerly gales near Cephalonia and Zante; also during the heavy south-easterly winds down that gulf in winter.

Directions.—To enter Petalás harbour a vessel should steer to pass the southern end of Petalás island at a distance of 2 cables, heading for Cape Ovriá (Glosa Ovrias), the extremity of a projection on the eastern side of the harbour; when Oxiá island is seen open eastward of Dhióni

Charts 1939, 3496, 1676, 203, 1800, 2158b.

Chart 1939.

peninsula, she should steer for the northern extremity of the land under the Khounovína hills (*Lat. 38° 25' N., Long. 21° 08' E.*), until Áyios Nikólaos (San Nicolo) chapel, situated on the neck of the promontory which forms the eastern point of Petalás island, comes in sight, when she should anchor as convenient. 5

COAST.—Danger.—For a distance of 2 miles northward of Khounovína hills, there is a swampy plain covered with weeds and intersected by creeks. The western side of this plain forms the head of a bay entered between the northern extremity of Petalás island and the southern extremity of Stení Gonía (Stenigonia) peninsula, about 1½ miles north-north-eastward. The north-eastern side of this bay rises steeply from the sea and the coast is rocky and indented; Kómaros bay, a narrow inlet, lies eastward of the southern part of Stení Gonía peninsula, and Pláka bay is entered between a point situated about 3½ cables east-south-eastward of the southern extremity of Stení Gonía peninsula and a point about 2 cables further south-south-westward. 10

A narrow ridge, with depths of less than 10 fathoms (18^m3) over it, mud and weed, extends north-westward from the head of the main bay to within half a mile of Day rock, page 115. Pondikó shoal, with a least known depth of 4½ fathoms (8^m2) over it, is situated on this ridge midway between the southern entrance point of Pláka bay and Pondikó island, page 114. Mount Velóútsi, 3,051 feet (929^m9) high, in line with Cape Pogoniá, bearing about 347°, leads westward of Pondikó shoal, and Kounéli islet lighthouse in line with the above-water rock on Xeropoúla reef, bearing 192°, also leads westward of the shoal. 25

Chart 3485.

Platiyiáli harbour.—Anchorage.—Platiyiáli (Plateali) harbour, the snuggest in the neighbourhood, is approached between the southern extremity of Stení Gonía peninsula and Cape Kárho (Carlo Glosa), about a mile north-westward; the entrance, about a quarter of a mile wide, lies 4 cables eastward of Cape Kárho. The northern end of Stení Gonía peninsula, on the south-eastern side of the entrance, is 100 feet (30^m5) high and is fringed by a shallow bank, about half a cable wide in places; this peninsula is connected to the mainland by a narrow isthmus. 35
Cape Kárho is the south-western extremity of Pogoniá peninsula, which forms the north-western side of Platiyiáli harbour. The harbour is fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, which is as much as 1½ cables wide at its head. There are no dangers outside depths of 3 fathoms (5^m5). 40

It was reported, in 1938, that many of the cairns shown on the chart did not then exist.

Good anchorage can be obtained in the centre of the harbour in a depth of 13 fathoms (23^m8), mud and good holding ground, thoroughly sheltered. 45

Health.—Fever is not uncommon in summer, and if a lengthy stay is contemplated it is better to anchor outside; the sea breeze may be expected not to reach the inside of the harbour till past mid-day and its duration is short. 50

Magnetic observation spot.—See Appendix III, page 606.

Chart 1939.

Coast.—Beacon.—Cape Pogoniá (Glosa Pogonias) is the western

Charts 3496, 1676, 203, 1800, 2158b.

Chart 1939.

extremity of Pogoniá peninsula which separates Platiyiáli and Pande-
leímon harbours. The cape is low and rocky ; a spit with a depth of
2½ fathoms (5^m0) over its outer end, extends about 2 cables westward
5 from the cape. A small red beacon, 5 feet (1^m5) high, stands on the
southern extremity of Cape Pogoniá, but is not easily distinguished
from the similar coloured background.

The summit of Oxiá island in line with the eastern extremity of
Pondikó island, bearing 169°, leads a cable westward of the spit extend-
10 ing from Cape Pogoniá.

Astakós bay.—The islands lying in the approach to Astakós
(Dragamesti) bay are described on pages 114-116. The bay is entered
between Cape Pogoniá and Cape Krithotí (Turkovekla), about 2 miles
west-north-westward. The north-western side of the bay is rugged,
15 consisting of the debris from the mountain slopes immediately behind.

Cape Krithotí (*Lat.* 38° 30' N., *Long.* 21° 03' E.) has an abrupt slope,
is 447 feet (136^m2) high and is steep-to ; the channel between it and
Kalóyiros, about 4 cables south-south-westward, is clear of dangers.

Marathiá bay is entered on the north-western side of Astakós bay,
20 between Cape Krithotí and a point about half a mile east-north-
eastward. Metaxotó, an islet, 14 feet (4^m3) high, lies close off a pro-
jection in Marathiá bay, about 3 cables north-eastward of Cape
Krithotí.

On the eastern side of Astakós bay, Pandeímon (Pandelemona)
25 harbour is entered between a point about half a mile north-eastward of
Cape Pogoniá and a point, about 2½ cables further north-eastward.

A remarkable crag, 22 feet (6^m7) high, is situated on the southern side
of Pandeímon harbour, about 4 cables eastward of the entrance.

The harbour is too confined for large vessels ; at its head there are
30 two short arms, the northern of which is shallow. The village of
Pandeímon, off which there are some small piers, lies at the northern
head of the northern branch.

The eastern side of Astakós bay is more indented than the north-
western side, and the hills inland slope less abruptly, and are of less
35 elevation. Northward of Padeímon harbour the eastern side is
fringed by a narrow, shallow bank.

At the head of Astakós bay depths of less than 5 fathoms (9^m1) extend
about 1½ cables offshore.

The town of Astakós (Astokos) is situated at the western end of the
40 head of the bay. A pier, in ruins, projects a short distance from the
south-western end of the wharf facing the town (*Lat.* 38° 32' N., *Long.*
21° 05' E.).

There is steamer communication with Patras and Corfu.

Water is led down to the wharf in pipes, but is unsafe for drinking.

45 The exports consist of wine, currants, corn, cattle and valonia.

Anchorage.—**Directions.**—Good anchorage may be obtained off
Astakós in depths of from 9 to 11 fathoms (16^m5 to 20^m1), or in
12 fathoms, mud, with the south-western end of the wharf bearing
302°, distant 3 cables.

50 Approaching from westward, northward of the Dhragonéra islands,
a vessel should steer 096° for the middle of the passage between Cape
Krithotí and Kalóyiros island, which will lead between Konstandía and
Sevastai banks, on the northern side, and Práso reef, on the southern
side ; also between Grant and Davy reefs. When Kalóyiros lighthouse

Charts 3496, 1676, 203, 1800, 2158b.

Chart 1939.

is abeam, course may be altered as necessary for the anchorage off Astakós.

From southward, the usual approach is eastward of Naváyion reef, through the channel between Prováti and Pondikó, and between Kárló and Day rock. A vessel may also use the channel eastward of Pondikó island, which is that generally used by vessels proceeding to Platíyiáli harbour, care being taken to avoid Pondikó shoal and Day rock, as previously directed.

Chart 3496.

Coast.—Dangers.—Lights.—From Cape Krithotí, the coast trends northward for about 9 miles to the south-eastern entrance point of Vóurkos bay, where there are some earth cliffs. With the exception of Khamiloí (Low) rocks, 3 feet (0^m9) high, which lie on a small bank, with depths of less than 5 fathoms (9^m1) over it, situated about 3 cables westward of the last-mentioned point, the coast is steep-to, with a few above-water rocks lying close offshore; the land behind is thickly covered with trees, and backed by high mountainous country, sparsely inhabited.

Vóurkos (Vurko) bay is entered between the point on the mainland eastward of Khamiloí rocks and Mítika, a cape, situated about 2½ miles north-westward. The northern and north-eastern shores of the bay consist of a sandy beach. The shores of the bay are fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, which is a quarter of a mile wide in places; off this bank the depths increase abruptly.

Mítika is low, sandy and steep-to. The village of Mítika, whence there is regular steamer communication with Patras and other ports, stands on the cape.

Mítika (Alyzia) bay, which is sandy, is entered between the cape of the same name and Cape Kamiláfka, about a mile west-north-westward; on the northern shore of the bay there is a solitary tree which was conspicuous in 1919. Cape Kamiláfka should not be approached within a distance of 3 cables, as the depths off it are irregular.

Within the shores of the bays just mentioned, there is a cultivated plain, beyond which the mountains rise abruptly.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column on a hut, 19 feet (5^m8) in height, on Mítika.

A light is exhibited, at an elevation of 77 feet (23^m5), from an iron obelisk on a concrete base, 16 feet (4^m9) in height, on Cape Kamiláfka.

Anchorages.—Vóurkos bay affords excellent anchorage, well sheltered from south-westerly winds by Kálamos, page 120, in depths of from about 12 to 15 fathoms (21^m9 to 27^m4), sand, at distances of from 5 to 8 cables eastward of Mítika light-structure, with the summit of Dhragonéra island in line with or just open of the eastern extremity of Kálamos, and Cape Kamiláfka in line with or just shut in by Mítika. Westerly winds, unless strong, do not reach the anchorage, but back south-eastward round Kálamos, thus heading a vessel under sail standing in for the anchorage. A weak current sets eastward.

There is anchorage in Mítika bay in depths of from 8 to 10 fathoms (14^m6 to 18^m3), sand.

OFF-LYING ISLANDS.—Átokos.—This island is situated with its north-eastern extremity (*Lat.* 38° 30' N., *Long.* 20° 50' E.) about 7 miles west-north-westward of Práso islet, page 115. Átokos is

Chart 3496.

1,095 feet (333^m8) high and steep-to all round, its three peaks, all nearly the same height, are conspicuous and form excellent landmarks, the two highest being near the southern end. The island is mostly covered
 5 with brushwood, but a portion is cultivated.

- Formikoúla.**—**Dangers.**—**Light.**—Formikoúla, an islet, lies 3½ miles north-north-eastward of Átokos and about a mile south-westward of Cape Kefáli (Kephali), the south-western extremity of the island of Kálamos. Formikoúla is 45 feet (13^m7) high and flat-topped.
 10 An above-water rock lies about a cable off the south-eastern extremity of the islet and a similar rock, close off its north-eastern extremity.

A light is exhibited, at an elevation of 56 feet (17^m1), from a white iron tower with a red band on a concrete base, 10 feet (3^m0) in height, situated on the summit of Formikoúla.

- 15 Formikoúla reefs are two in number; the one with the least depth over it, lies three-quarters of a mile north-north-westward of the northern extremity of Formikoúla islet, and has a depth of 2 fathoms (3^m7) over it, rock, sand and shells; the other lies a quarter of a mile west-south-westward of this reef, has a depth of 5 fathoms (9^m1) over
 20 it, and is steep-to.

A mill on the island of Kastós in line with the southern extremity of Kálamos, bearing 110°, leads north-eastward of the reefs; the eastern extremity of the island of Prómonas, bearing 147°, and open south-westward of the south-western extremity of Formikoúla, leads
 25 south-westward of them.

Formikoúla reefs are covered by the *red* sector of Formikoúla light between the bearings of 180° and 000°.

- Kastós.**—Kastós, an island, lies with its south-western extremity (*Lat.* 38° 32' N., *Long.* 20° 54' E.) about 2½ miles south-eastward of
 30 Formikoúla lighthouse. The island is partly cultivated, hilly and studded with trees. The summit, 520 feet (158^m5) high, lies about 1½ miles from its northern end. The western coast is straight and almost parallel with the south-eastern coast of Kálamos, from which it is separated by a channel, about 6 cables wide in its narrowest part, and
 35 in which the depths are considerable; its southern and eastern coasts are indented with many small inlets, only suitable for small vessels with local knowledge.

- Sarakíniko (Saraceniko) bay, which has an islet, 10 feet (3^m0) high, near its head, is situated on the western side of Kastós, and Kastós
 40 harbour, nearly abreast of it on the eastern side of the island, where the village of the same name is situated, are those principally used; the mill on the top of the low ridge separating these indentations appears conspicuously on the sky line.

- Práso, an islet, 26 feet (7^m9) high, and covered with low scrub, lies
 45 close off the eastern side of Kastós, about 2 miles north-north-eastward of its south-eastern extremity.

Prováti, an islet, 140 feet (42^m7) high, lies about 1½ cables off the northern end of Kastós with considerable depths between.

- Kálamos.**—**Anchorages.**—Cape Kefáli is mentioned above. The
 50 north-eastern end of Kálamos, an island, is separated from the mainland northward and eastward by a channel in which the depths are considerable; the width of this channel between Cape Asproyiáli (Aspro Gali), the north-eastern extremity of the island, and Khamilof rocks, page 119, eastward, is about one mile.

Charts 203, 1800, 2158b.

Chart 3496.

Kálamos is nearly divided into two parts, connected by a narrow isthmus; a mountainous ridge extends the whole length of the island. Mount Ai Lias (Kalomo), situated near the centre, is flat-topped and 2,445 feet (745^m2) high. The land falls sharply eastward of Mount Ai Lias, rising again in a uniform slope to Mount Vounó (Vuni), 2,225 feet (678^m2) high, overlooking Cape Asproyiáli; south-westward of Mount Ai Lias, the slope is more gradual to Mount Xilókastron, 1,950 feet (594^m4) high, beyond which the land again falls abruptly. The southern portion is much lower, its highest part, about a mile north-eastward of Cape Kefáli, being 890 feet (271^m3) high.

The coast of this island is bold and generally steep-to all round, and may be approached safely to the distance of a quarter of a mile.

Yerolimniónas bay is situated on the south-eastern side of Kálamos, with Leóne cove at its head, about 1½ miles north-north-eastward of Cape Kefáli; this cove only affords shelter to small vessels, with local knowledge.

The town of Kálamos, situated on the south-eastern side of the island, about 2½ miles north-eastward of Leóne cove, has a rudely constructed mole, three-quarters of a cable long, with depths, in 1937, of from 11 to 13 feet (3^m4 to 4^m0) within it, forming a small harbour which affords accommodation for a few small vessels.

There is anchorage north-eastward of this mole in a depth of 8 or 9 fathoms (14^m6 or 16^m5) only 2 cables offshore. Heavy squalls, even in summer, blow from the high land in the neighbourhood and a good scope of cable is necessary.

For any long stay, a more protected anchorage, though in considerable depths, is afforded near mid-channel, westward of the northern extreme of Prováti (*Lat.* 38° 36' N., *Long.* 20° 57' E.). The depths in this position, 30 fathoms (54^m9), are less than those in the channel south-westward and north-eastward.

Chart 203.

COAST.—Lights.—From Cape Kamiláfka, the coast trends 7 miles northward in nearly a straight line to the village of Zavérdha. The land rises in steep limestone ridges to Mount Matsoúki (Kandili), 3,809 feet (1161^m0) high, which stands 1½ miles inland and about 4½ miles northward of Cape Kamiláfka; from the summit of this mountain, the ridge slopes gradually southward. The coast, southward of the mountain, is generally steep-to, but northward, it is bordered by a narrow bank, with depths of less than 5 fathoms (9^m1) over it.

Zavérdha bay is entered between the coast abreast Mount Matsoúki and Cape Varkó (Varcos) (chart 1609), about 4 miles west-north-westward. Nisiópoula (Poghonia), a group of rocky islets, lie, on the north-western side of this bay, about three-quarters of a mile north-eastward of Cape Varkó and close offshore. There is a beach at the head of the bay and the coastal bank, off the western part of the head, is as much as 6 cables wide. The cultivated valley northward of Zavérdha bay is the southern end of the plain extending about 7½ miles northward to Vónitsa, on the southern side of the Gulf of Amvrakía.

The village of Zavérdha is situated on the eastern side of the head of the bay; a very conspicuous white house stands about 2 miles south-south-eastward of the village.

The anchorage is off the beach north-westward of the village, in a

Charts 1676, 203, 1800, 2158b.

Chart 203.

depth of 10 fathoms (18^m3), mud. There is a small stone pier, but there is only a depth of one foot (0^m3) alongside. The best landing place is at the head of the bay, close eastward of a bridge.

- 5 There is a Customs house at Zavérdha.

There is regular steamer communication with Levkás and Patras.

A light (*Lat.* 38° 47' N., *Long.* 20° 53' E.) is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a hut with a concrete base, situated on the pierhead at Zavérdha.

- 10 *Chart 1609, plan of Levkas road and Port Drepano.*

Between Cape Varkó, which projects south-westward, and Cape Parathíra (Parathera), about a mile west-south-westward, there are two bays; Varkó bay, with a beach and cultivated land at its head, is situated on the north-western side of Cape Varkó, and Marathíá bay

- 15 about half a mile further westward.

Small vessels, with local knowledge, can anchor in the north-eastern corner of Varkó bay, in a depth of about 5 fathoms (9^m1), sheltered from south-easterly winds by Cape Varkó.

- Áyios Nikólaos islet, 67 feet (20^m4) high, lies in the approach to the
20 two bays just mentioned, about half a mile south-westward of Cape Varkó. The islet is bordered by a bank, with depths of 6 fathoms (11^m0) and less over it, which is as much as a cable wide off its south-western side.

- Vathíá Aváli (Vathi Vali) bay, open south-westward, is entered
25 between Cape Parathíra and a point about 4 cables westward. The depths in this bay decrease rapidly between the entrance and the head, where a rocky bank, with depths of less than 2 fathoms (3^m7) over it, extends about 1½ cables offshore.

Chart 1609, plan of Levkas road and Port Drepano.

- 30 Áspro Yialí (Aspro Yali) bay lies between the western entrance point of Vathíá Aváli bay and Cape Kefáli (Kephali), about half a mile west-north-westward.

- Cape Kefáli, the south-eastern entrance point of Dhrépanon bay, page 127, is 35 feet (10^m7) high, bold, projecting and fringed by sunken
35 rocks lying close offshore. The cape is the south-western termination of Mount Tris Píryoi (Saussi), 1,650 feet (502^m9) high, about 3½ miles north-north-eastward.

A light is exhibited, at an elevation of 43 feet (13^m1), from a framework structure, 16 feet (4^m9) in height, on Cape Kefáli.

- 40 **Danger.**—Miaoúli (Miaulis) reef, with a least depth of 1½ fathoms (2^m7) over it, and steep-to, lies about half a mile south-eastward of Cape Kefáli and from 2 to 3 cables offshore. The light on Voliós islet, page 127, is obscured over Miaoúli reef.

Chart 203.

- 45 **LEVKÁS.**—**General remarks.**—Levkás, an island, lies with Cape Doukáton (Dukato), its south-western extremity, about 5 miles northward of the northern extremity of Cephalonia, page 105. The north-eastern end of the island is separated from the mainland by a narrow channel.

- 50 Levkás has a lofty limestone ridge extending the whole length of the island with several spurs running eastward. Mount Stavrotós (*Lat.* 38° 42' N., *Long.* 20° 39' E.), 3,700 feet (1127^m8) high, the southern and highest peak, has a double top and is conspicuous from northward and

Charts 203, 1800, 2158b.

Chart 203.

westward. During the winter the more elevated peaks are usually snowclad.

The island has several fertile plains, of which the largest extends south-westward of Levkás, the capital, at the north-eastern end of the island. This town is bordered on three sides by shallow lagoons, with large salterns on its south-eastern side. The principal products are olives, oil, wine, wheat, maize and salt.

The climate is healthy, except along the north-eastern coast where intermittent fever prevails during the summer. Earthquakes are frequent during the hot months, but are scarcely perceptible.

There were about 30,000 inhabitants in 1926.

South-eastern side of Levkás. — Danger. — Light. — Cape Doukátón is bold and, with the exception of the shoal described below, steep-to; a dark islet lies close south-eastward of the cape. There is often a perceptible current near the cape.

A shoal, having a least known depth of 5 fathoms (9^m1) over it, and steep-to, lies $1\frac{1}{2}$ cables southward of Cape Doukátón. In 1882, the Greek revenue steamer *Cephalonia* reported a shoal, half a mile southward of Cape Doukátón, with a least depth of 13 feet (4^m0) over it; this was unsuccessfully searched for by H.M. ships *Superb* and *Hecla* and no trace of shoal water discovered in that direction. H.M.S. *Téméraire*, in examining the locality, discovered the shoal just described, which is probably identical with that reported by the Greek steamer.

Cape Doukátón should be passed at a distance of not less than three-quarters of a mile; at night, when passing south-westward of the cape the light on Cape Fiskárdo, page 107, should not be visible; this light is obscured when bearing less than 155° .

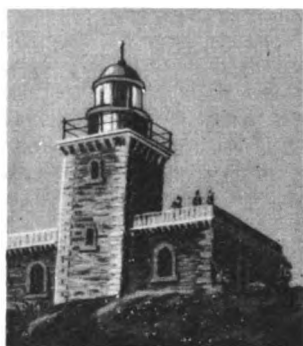
A light is exhibited, at an elevation of 229 feet (69^m8), from a square masonry tower and dwelling, 44 feet (13^m4) in height, situated about 2 cables north-eastward of Cape Doukátón (Lat. $38^\circ 34'$ N., Long. $20^\circ 34'$ E.). See view.

Between Cape Doukátón and the south-western entrance point of Meganisi strait, about 9 miles east-north-eastward, the coast is high, bold, and much indented, the principal inlet being Vasiliki bay.

Vasiliki (Vasilico) bay is entered between Cape Doukátón and Cape Lípso, about 5 miles east-north-eastward, and affords excellent shelter. The best anchorage is off the sandy beach at its head, in depths of from 12 to 15 fathoms (21^m9 to 27^m4), sand; closer in, the depths decrease rapidly from 7 to 2 fathoms (12^m8 to 3^m7). A good berth may also be found about half a mile westward of the village of Vasiliki, situated at the eastern end of the sandy beach, in a depth of 10 fathoms (18^m3), mud. Three moles extend off the village of Vasiliki, which afford shelter to small vessels, with local knowledge, during southerly winds. The southernmost and longest mole is about a cable in length.

A small stream flows into the head of the bay.

The submarine cable to Ithaca is landed near the village.



Cape Doukátón lighthouse.

Chart 203.

Between Cape Lípso and the south-western entrance point of Meganísi strait, previously mentioned, there are three bays, Aftéli (Aphteli), the westernmost, Sívota, and Roúdha (Ruda), the easternmost.

Chart 1620, plan of Meganísi channel and Port Vliho.

Sívota bay affords good shelter at its head for small vessels, with local knowledge; in the other two bays, and in the entrance to Sívota bay, the depths are too great for anchoring. Mount Póros (Porro), 1,670 feet (509^m0) high, stands on the eastern side of the head of Roúdha bay, about 1½ miles from its eastern entrance point.

Chart 203.

Off-lying island.—**Caution.**—Arkoúthi (Arkudi), an island, lies about 2½ miles south-eastward of Cape Lípso and about 3 miles north-eastward of the northern extremity of Ithaca. The island is 441 feet (134^m4) high and rocky; a sunken rock is charted about 2 cables off its south-eastern extremity, and foul ground extends a similar distance from its south-western extremity; with these exceptions, the island is steep-to.

In 1869, H.M.S. *Bellerophon* was supposed to have grazed the rock south-eastward of Arkoúthi, just mentioned. Although a subsequent search was fruitless, mariners are cautioned not to approach the salient points of the islands and coast in this locality too closely.

Chart 1620, plan of Meganísi channel and Port Vliho.

Méga.—**Lights.**—Méga (Meganisi), an island, is separated from Levkás by Meganísi strait, described on page 125, and lies with Cape Kefáli (Kephali), its south-eastern extremity, about 2½ miles west-north-westward of Cape Kefáli, the south-western extremity of Kálamos, page 120. Méga is hilly and the valleys are cultivated; the hills range from an elevation of 202 feet (61^m6), at its north-eastern part, to 874 feet (266^m4), at its south-western part.

Cape Kefáli is the termination of a narrow strip of land which projects about 4 miles south-eastward and forms a bight on the eastern side of Méga between it and Cape Langádha, about 4 miles northward; the sides of this bight are everywhere bold and the depths in it are considerable. A village is situated on the north-western side of the bight, a short distance inland.

Between Cape Langádha and Cape Makríá (Macria), about 1½ miles north-westward, there are several small inlets in the north-eastern side of Méga, affording accommodation for small vessels, with local knowledge.

Cape Áyios Ilías (Elia), close off which there is a sunken rock, lies about three-quarters of a mile north-north-eastward of Cape Langádha.

Atherínos (Atheni) bay is entered between Cape Áyios Ilías and the north-eastern end of a projection, about 4 cables north-westward. A rock, 20 feet (6^m1) high, on which there is a light-structure, lies about 1½ cables north-eastward of this projection, connected to it by a reef, and Alafomíti, an islet, 24 feet (7^m3) high, lies a short distance northward of the projection, to which it is also connected by a reef.

Ambelákia (Abelike) bay is the south-eastern of two bays situated between Alafomíti and Cape Makríá (*Lat.* 38° 41' N., *Long.* 20° 48' E.).

A light is exhibited, at an elevation of 46 feet (14^m0), from an iron column, 19 feet (5^m8) in height, with its lower part surrounded by

Charts 3496, 203, 1800, 2158b.

Chart 1620, plan of Meganisi channel and Port Vliho.

a white wall having a red band, situated on Cape Áyios Ilías (*Lat.* 38° 40' N., *Long.* 20° 49' E.).

A light is exhibited, at an elevation of 36 feet (11^m0), from a red iron framework structure, on the northern side of the approach to Atherínos bay, about half a mile north-north-westward of the light-column on Cape Áyios Ilías.

Kíthros, an island, 300 feet (91^m4) high, lies with its south-eastern extremity about 4 cables south-westward of Cape Kefáli and is separated from the coast of Méga, north-eastward, by a deep channel, 10 1½ cables wide. Kíthros is bordered by a bank, over which the depths are uneven, and which is as much as a quarter of a mile wide at its western end.

Pétalos (Petallis), a barren, rocky islet (*Lat.* 38° 35' N., *Long.* 20° 47' E.), lies three-quarters of a mile west-north-westward of Kíthros, and is 29 feet (8^m8) high; it is bordered by a rocky bank, over which the depths are uneven and which extends as much as 3 cables from the north-western side of the islet.

Meganisi strait.—This strait is entered between the eastern entrance point of Rouútha bay, page 124, and a point on the south-western side of Méga, about 1½ miles east-north-eastward. The strait is about half a mile wide in its narrowest part. Northward of the north-western extremity of Méga, the strait is divided by Skorpiós, an island, one part continuing northward between that island and Levkás, the other passing eastward between Skorpiós and Méga.

On the western side of Meganisi strait, the coast of Levkás is high and bold and trends northward for 5 miles to the eastern entrance point of Vlikhó bay, page 126. This coast is indented by Dhéssimo (Dessimo) bay, about midway.

On the eastern side of Meganisi strait, the coast of Méga is clifty for a distance of about three-quarters of a mile, whence the coast is low for about 1½ miles and bordered by a bank, over the southern part of which, where it is about a cable wide, there is a depth of 2½ fathoms (4^m6). On this bank, about three-quarters of a mile further northward, is Thília (Tiglia), an islet, 130 feet (39^m6) high, with its northern part about a cable off Méga. Foul ground extends about a cable from the southern end of Thília, and a narrow, shallow bank fringes its eastern side.

There is anchorage for small vessels, with local knowledge, between Thília and Méga, in depths of from 10 to 12 fathoms (18^m3 to 21^m9) sand.

Monodhéndri (One Tree), a hill, 521 feet (158^m8) high, stands at the north-western end of Méga.

Skorpiós (Skropio), an island, lies with its southern extremity about 1½ miles northward of Monodhéndri; the island is 186 feet (56^m7) high, and its south-eastern side is steep-to. Cape Kastri, with an above-water rock close off it, projects from the south-eastern side of the island.

On the south-eastern side of the eastern branch, the northern side of Méga is indented by two bays; Spiliá (Spiglia), the south-western bay has the village of Spartokhóri at its head, and Vathí harbour, the north-eastern bay, the village of Vathí at its head. These two bays afford the most important anchorages in the island for small vessels, with local knowledge.

On the south-eastern side of the northern branch, Sokáva, an islet,

Charts 3496, 203, 1800 2158b

Chart 1620, plan of Meganísi channel and Port Vliko.

60 feet (18^m3) high, with sunken rocks extending a short distance northward and southward of it, lies about a cable off the western side of Skorpiós. A bank, with a depth of one fathom (1^m8) over it, 5 extends a short distance off the north-western extremity of Skorpiós and Skorpidhi (Skropidi), an islet, lies about a cable north-north-eastward of the same extremity, with a depth of 10 fathoms (18^m3) in the fairway between. A bank, with depths of less than 5 fathoms (9^m1) over it, extends about a cable off the northern and eastern sides of 10 Skorpidhi (*Lat.* 38° 42' N., *Long.* 20° 46' E.).

On the north-western side of this part of Meganísi strait, Madhourí (Moodra), an islet, lies about 4 cables east-north-eastward of the eastern entrance point of Vlikhó bay, page 125, and Spárti, an island, lies with its south-western extremity about half a mile further east- 15 north-eastward. The south-eastern side of Spárti is steep-to.

Dangers.—Ieromíti (Hieromiti) shoals, consisting of three rocky patches, lie near the middle of the eastern branch of the northern part of Meganísi strait; two of the patches, about a cable apart, and with a depth of 3 feet (0^m9) over them, lie about half a mile east-south- 20 eastward of Cape Kastri, page 125; the third patch, with a depth of 2 fathoms (3^m7) over it, lies about 3½ cables further east-south-eastward. These dangers are steep-to.

Monodhéndri, on Méga, in line with the southern fall of Mount Póros, on Levkás, bearing 224°, leads south-eastward of Ieromiti shoals. 25 See view A on chart 1620.

A shoal, with a depth of 1½ fathoms (3^m2) over it, lies in the northern part of Meganísi strait, about 3½ cables south-south-westward of the western extremity of Madhourí and close off the coast of Levkás.

Vlikhó bay and approach.—Spárti and Madhourí lie on the south- 30 eastern side of the north-eastern approach to Vlikhó (Vliko) bay. A bank, over which the depths are uneven, extends about a quarter of a mile westward from the southern end of Spárti; on the outer end of this bank, there is a rocky patch, with a depth of 1½ fathoms (2^m3) over it.

35 On the north-western side of the approach, Cape Maíménos (Maio-menos) lies about 1½ miles north-north-westward of the northern extremity of Spárti. The cape is fringed by sunken rocks, and also the coast, for a distance of about 4 cables, southward of it.

Khelóni (Socava), an islet, 60 feet (18^m3) high, lies on the north- 40 western side of this approach, about 3½ cables northward of Madhourí and about a cable off the coast of Levkás; the passage between Khelóni and the above-mentioned 1½ fathom (2^m3) patch, south-eastward, is a quarter of a mile wide. A bank, with a depth of 1½ fathoms (2^m3) over its outer edge, extends about 2 cables off the 45 coast of Levkás, about half a mile south-westward of Khelóni. See view of entrance to Port Vliko on chart 1620.

Vlikhó bay can also be approached from south-eastward between Madhourí and the eastern entrance point of the bay, page 125, but care must be taken to avoid the 1½-fathom (3^m2) patch close off the coast in 50 the vicinity of the latter point, previously mentioned.

Vlikhó bay is entered through a narrow channel, about three-quarters of a mile long, in which there is a least depth of 4 fathoms (7^m3). There is high land on all sides of the bay and its shores are bordered by a bank, with depths of less than 3 fathoms (5^m5) over it,

Charts 203, 1800, 2158b.

Chart 1620, plan of Meganisi channel and Port Vista.

which, at its head, where the ground is marshy, is about 3 cables wide.

The village of Vlikhó, where there are a customs house and a health office, is situated on the western side of the head of the bay.

Chart 1609, plans of Levkas road and Port Drepano, and Levkas canal.

Dhrépanon bay.—Anchorages.—Dhrépanon (Drepano) bay is entered between Cape Kefáli, page 122, and Cape Maïménos, about $1\frac{1}{4}$ miles south-westward. On the western side of the bay, the coast is fringed by a narrow, shallow bank, which is rocky for a distance of about $1\frac{1}{4}$ miles northward of Cape Maïménos. The fortress of Áyios Yeóryios, which is conspicuous, stands on a hill, 223 feet (68^m0) high, at the head of the bay. There is a windmill about 3 cables east-north-eastward of the fortress. Voliós, an islet, 16 feet (4^m9) high, lies close off the western base of this hill. There is a conspicuous yellow house on the point on Levkás island, situated about one mile south-south-westward of Voliós.

Chart 1609, plan of Levkas canal.

There is anchorage at the head of the bay south-westward of Áyios Yeóryios fortress, in depths of from 42 to 72 feet (12^m8 to 21^m9), good holding ground.

The inner anchorage extends about 2 cables northward of the submerged mole, on the western side of the entrance to Levkás channel, described below, and has depths of from 13 to 18 feet (4^m0 to 5^m5).

Lights.—The light on Cape Kefáli is described on page 122.

A light is exhibited, at an elevation of 26 feet (7^m9), from a white masonry column, 13 feet (4^m0) in height on Voliós islet (*Lat.* 38° 47' N., *Long.* 20° 44' E.).



Voliós islet and light-structure.

Directions.—A vessel, when entering Dhrépanon bay at night, should keep in the *green* sector of Voliós islet light, and, when anchoring at the head of the bay she should not bring the light to bear more than 032°.

Levkás channel.—Beaconage.—This channel, between Levkás island and the mainland, runs from the head of Dhrépanon bay to the southern side of Dhérmata bay, about 3 miles northward, and is navigable by vessels drawing 14 feet (4^m3), the depth in the middle of the channel being maintained, by dredging, to 15 feet (4^m6). The dredged portion of the channel is about 32 yards (29^m3) wide at the surface, and 16 yards (14^m6) wide, at the bottom. The channel is clearly defined (except where it crosses the old channel) by the colour of the water, which is light yellow in the deepest part and dark green in the shallows. The depths in the channel decrease with northerly winds and increase with southerly winds to the extent of about one foot (0^m3); the movement of the water depends on the wind, the rate of the current varying from half a knot to $1\frac{1}{4}$ knots.

Charts 203, 1800, 2158b.

R*

Chart 1609, plan of Levkas canal.

There was a least depth of 17 feet (5^m2) in the channel, in 1945.

The channel is marked by perches, which are not to be relied on, and, the southern portion, by can buoys.

- 5 The southern entrance to Levkás channel, 60 yards (54^m9 wide and having a depth of 24 feet (7^m3), is between the remains of a stone pillar, one foot (0^m3) high, and a red can buoy; the former is situated about half a cable westward from Voliós, and the latter marks the eastern end of the remains of an ancient mole extending about 1½ cables
10 from the coast of Levkás island; there is a depth of 10 feet (3^m0) between Voliós and the stone pillar; and there are depths of about 5 feet (1^m5) over the outer end of the ancient mole on the western side.

There is a pier about 4 cables north-westward of Voliós islet lighthouse, with a depth of 5 feet (1^m5) alongside, but boats should approach
15 with caution and should not pass over the submerged mole. There are two piers about 1½ and 2½ cables, respectively, north-eastward of this pier, each with a depth of 3 feet (0^m9) alongside.

The anchorage in this vicinity is described on page 127.

- On the eastern side of the channel there is an islet, with its southern
20 extremity, about half a mile northward of Voliós islet lighthouse. There is an old fort on the islet, and a beacon at its southern end.

On the western side of the channel, abreast the southern end of this islet, there is a red-roofed hut with a beacon close eastward of it. Close northward of the hut, a low bank extends about a quarter of
25 a mile northward.

Paliokhaliá (Paleo Khalia), an island, with a small group of low grey houses on it, lies eastward of the channel, about three-quarters of a mile northward of Voliós islet lighthouse, separated from the mainland by a creek.

- 30 From a position about a mile northward of Voliós islet lighthouse, the eastern side of the channel has been protected by a low stone wall, but this has been mostly destroyed by the wash of passing vessels, and a shallow bank, from 10 to 15 yards (9^m1 to 13^m7) wide, extends off the wall throughout its length. Mounds of sand were visible along the
35 eastern side of the channel, in 1945.

Between the two salterns which are situated on the western side of the channel, there is a muddy swamp covered with weed, in the middle of which stands Áyios Konstandínos (St. Constantinos) fort (Lat. 38° 49' N., Long. 20° 44' E.), which is conspicuous.

- 40 Levkás harbour is situated about 1½ miles north-north-westward of Áyios Konstandínos fort. There is a quay on the south-western side of the harbour, from the north-western end of which a causeway, with several bridges, extends about half a mile, in a north-north-easterly direction, to the root of a mole which extends about 3 cables further
45 north-north-eastward and then a short distance eastward; a shallow bank, from 10 to 30 yards (9^m1 to 27^m4) wide, fringes the causeway.

The northern entrance of Levkás channel lies between the head of the mole and the citadel which is erected on the south-western end of a narrow strip of low ground which forms a portion of the mainland
50 coast, about 1½ cables southward. See view facing this page.

There is a depth of 15 feet (4^m6), on the eastern side of the channel, alongside the quay abreast the citadel.

The mole, on the western side of the channel, gives shelter to small vessels from north-westerly winds; along the mole, there are bollards,



Northern entrance of Levkás channel.

(Original dated 1940.)

Chart 1609, plan of Levkas canal.

and by dropping an anchor, north-eastward, a vessel can haul in and secure to the mole. Small vessels, with local knowledge, haul into the channel under the citadel.

The old channel, with depths of from 7 to 13 feet (2^m1 to 4^m0), is entered close eastward of the islet with a beacon at its southern end, previously mentioned. Thence it passes close south-westward of Paliokhaliá and crosses the dredged channel in a north-westerly direction, passes close eastward of Áyios Konstandínos fort and joins the dredged channel about 3 cables further northward. Sailing vessels make use of this old channel when the wind is less favourable in the other; there is anchorage off Paliokhaliá, where there is a small pier.

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

There are no regulations for entering or leaving the channel; in a vessel of some size, it would be proper, before entering, to sound the whistle and ascertain if any other vessel has entered from the opposite end.

Caution.—The wash of passing vessels is sometimes sufficient to carry a small boat on to the top of, or even over, the wall. Boats should, as far as possible, keep well clear of the wall and stem the wash.

A floating bridge, worked by a wire, crosses the channel just southward of the citadel; the wire is sunk on a vessel's approach; notice of which should be given by the whistle or siren.

Levkás harbour and town.—There are depths of from 13 to 16 feet (4^m0 to 4^m9) in Levkás harbour, and from 11 to 13 feet (3^m4 to 4^m0) alongside the quay, on which there is a crane.

The town, which contained about 5,000 inhabitants, in 1945, is situated on the western side of the channel, about three-quarters of a mile south-westward of the northern entrance. There are three piers at Levkás, of which the southernmost has a depth of about 5 feet (1^m5) alongside.

There is regular steamer communication with Patras.

The customs house and health office are southward of the quay.

Olive oil and wine are exported.

Lights.—A light is exhibited, at an elevation of 57 feet (17^m4), from a white square masonry tower on a dwelling, 19 feet (5^m8) in height, situated on the northern wall of the citadel (*Lat.* $38^{\circ} 50' N.$, *Long.* $20^{\circ} 44' E.$). See view.

A light is exhibited, at an elevation of 22 feet (6^m7), from an iron structure and hut on the mole-head at the northern entrance of Levkás channel.

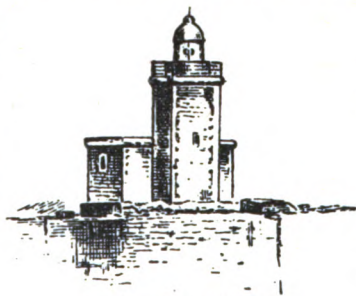
A light is exhibited on a wreck in the channel, about half a cable west-south-westward of the lighthouse on the citadel.

Submarine cable.—The submarine cable from Corfu is landed on the coast north-westward of Levkás channel. It crosses the channel just southward of the lighthouse on the citadel, between a small hut on each side.

Chart 203.

Western and northern sides of Levkás.—From Cape Doukátou,

Charts 203, 1800, 2158b.



Levkás citadel light-tower.

Chart 203.

page 122, the high western side of Levkás trends in a north-north-easterly direction for 14 miles to Cape Áyios Nikítas, a bluff promontory forming the western side of a small inlet, open northward, where
 5 there is a roadstead of the same name, which, in fine weather, may be used by boats; thence the coast trends about 3 miles further north-north-eastward to Cape Áyios Ioánnis (Zuana) (*Lat.* 38° 50' N., *Long.* 20° 40' E.).

For a distance of about 6½ miles from Cape Doukátón, the coast is
 10 slightly indented and has a whitish appearance.. It is fringed in places by above-water and sunken rocks to the distance of about a cable offshore. Cape Pídhima tís Sapfoús (Sappho's leap), a remarkable, triangular, white cliff, 780 feet (237^m7) high, lies 2 miles northward of Cape Doukátón.

15 Sésoula (Sesola) rock lies about 8 miles northward of Cape Doukátón and 1½ miles offshore; the rock is 114 feet (34^m7) high and slopes northward; it is perpendicular on its south-south-western and south-eastern sides, where many huge rocky fragments show above water, close inshore. Foul ground extends about a cable off its northern end,
 20 and its southern end is perforated. The depths between Sésoula rock and the coast are considerable.

Cape Áyios Ioánnis is a bold, cliffy headland, clear of dangers except for a few sunken rocks close offshore. It forms the south-western entrance point of Fléva (Flava) bay.

25 *Chart 1609, plan of Levkas road and Port Drepano.*

Cape Yerápetra (Gyrapetra), 2 miles north-eastward of Cape Áyios Ioánnis, is the northern extremity of Levkás and the north-eastern entrance point of Fléva bay; foul ground extends a quarter of a mile off the cape. On Cape Yerápetra there are three tumuli and, on the
 30 coast south-south-westward of the cape, there are several windmills.

Dhérmatá bay.—Anchorages.—Dhérmatá (Demata) bay, sometimes called Levkás bay, is entered between Cape Yerápetra and the north-eastern extremity of Pláka spit, about 2½ miles east-north-eastward.

35 From Cape Yerápetra to the northern entrance of Levkás channel, about 1½ miles east-south-eastward, there is a narrow strip of shingle beach, which, in most parts, has become as compact and solid as rock, southward of which there is a shallow lagoon.

The foul ground off Cape Yerápetra and the coastal bank off the
 40 shingle beach, except at its eastern end, are covered by the *red* sector of the light on the citadel at the entrance of Levkás channel, between the bearings of 075° and 120°.

From the eastern side of the entrance to Levkás channel, a narrow strip of low land extends about a quarter of a mile eastward and then
 45 half a mile north-eastward, where it is nearly connected to the south-western end of Pláka spit, a narrow stony ridge, one foot (0^m3) high, extending about a mile in a north-easterly direction. A reef extends 4 cables northward from the north-eastern extremity of Pláka spit, terminating in a ridge of huge boulders, which forms the edge of the surf
 50 in strong north-westerly winds.

The conglomerate formation of Pláka spit is seen also at Cape Yerápetra, whence it skirts the coast eastward and northward to Préveza strait; in places it is broken, forming numerous rocks.

There are depths of less than 6 fathoms (11^m0) at a distance of 3 cables

Charts 213, 1800, 2158b.

Chart 1609, plan of Levkas road and Port Drepano.

westward of the reef extending northward of Pláka spit. The coastal bank, with depths of less than 6 fathoms (11^m0) over it, is as much as 4 cables wide at the head of the bay, close eastward of Levkás channel. Between Pláka spit and the mainland, south-eastward, there are some strips of low land and some islands surrounded by shallow water. 5

In summer, during fine weather, vessels may find temporary anchorage in Dhérmata bay, in a depth of about 8 fathoms (14^m6), about half a mile north-north-westward of the citadel lighthouse. Large vessels should anchor further out in depths of from 12 to 15 fathoms (21^m9 to 27^m4). This anchorage is open to northerly and north-westerly winds, which cause a heavy sea.

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

Winds.—Land and sea breezes are very regular in summer; the former blow from about 2200 until 0500; the latter set in about 1000 and cease about 1900, with calms during the intervals. During thunderstorms, heavy squalls may be expected from the mountains. 15

COAST.—Áyios Nikólaos bay lies between Tekés (Peki) fortress (Lat. 38° 51' N., Long. 20° 45' E.), on the mainland about a mile eastward of the northern entrance to Levkás channel, and Cape Paliokoúla (Poonda), where there are ruins, about 3 miles north-north-eastward; on the south-eastern side of the bay, the land is high and cliffy, and, on the north-eastern side, it is low and marshy. At the head of the bay, between a bluff point, 60 feet (18^m3) high, on the southern side, and a sandy spit projecting southward from the low, marshy land, on the northern side, is the entrance to Khelodhívaro (Cheloevero), a shallow area abounding in fish. 20

Áyios Nikólaos bay is, for the most part, shallow and encumbered with rocks, but there is an area near its head where there are depths of from 3½ to 3¾ fathoms (5^m9 to 6^m9), mud and excellent holding ground. The bay is protected on its south-western side by Pláka spit, previously mentioned. 30

Áyios Nikólaos islet lies about 2 cables south-eastward of the north-eastern extremity of Pláka spit; Doozinani reef, the centre part of which is above water, lies from 5 to 6½ cables north-north-eastward of the islet, and has an obelisk on it. Akhillévs (Achiloo) reef, awash, lies from 5 to 6½ cables northward of Doozinani reef, and, between them, is the channel leading into Áyios Nikólaos bay. The channel is tortuous and should only be used by small vessels, with local knowledge.

On the north-eastern side of Áyios Nikólaos bay there are some sunken rocks lying close offshore. 40

The sea breeze forces a considerable quantity of water into Áyios Nikólaos bay, which, when the breeze dies away at sunset, runs out with some strength.

A vessel working up to the anchorage in Dhérmata bay in the vicinity of the dangers in the approach to Áyios Nikólaos bay should not stand into a depth of less than 8 fathoms (14^m6), and should keep Mount Lámbia, 1,296 feet (395^m0) high, open south-westward of the buildings on Áyios Nikólaos islet. Mount Lámbia stands about three-quarters of a mile eastward of Tekés fortress. 50

Chart 203.

From Cape Paliokoúla to Cape Skílla (Skylla), about 2 miles north-north-westward, the coast is low and flat, with sunken rocks lying close

Charts 213, 1800, 2158b.

Chart 203.

offshore; the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about a mile wide off this stretch of coast.

GULF OF AMVRAKÍA AND APPROACH. — **General**
 6 **remarks.**—The Gulf of Amvrakía, formerly known as the Gulf of Arta, and called Amvrakikós Kólpos by the Greeks, is entered through Préveza strait. The coast of the gulf is so indented by bays with long projecting points, that in places the dangers off the latter, on opposite sides of the gulf, are barely 2 miles apart. There are a few islets, some
 10 of which are covered with shrubs and verdure.

The Greek and Roman remains on the margin of the gulf are of particular interest. About 3 miles northward of the town of Préveza is the ancient site of Nikópolis, the city founded by the Emperor Alexander to celebrate his victory at Actium over the forces of Mark
 15 Anthony and Cleopatra; the ruins of this city lie scattered over a large area. At the foot of a range of hills, about three-quarters of a mile northward of Nikópolis, there is an amphitheatre, the most conspicuous of all the ruins.

Within the shores of the gulf the hills are composed of rugged lime-
 20 stone. The northern shore of the gulf is an irregular stretch of swamp, marsh, and lagoon, in many places only separated from the water of the gulf by a narrow strip of sand and mud, which in winter is overflowed and makes the gulf appear much more extensive than it really is. Malaria is very prevalent in this locality in the summer.

25 These marshes are infested by snakes and reptiles, some of which are venomous; the mosquitoes are troublesome in every part of the gulf.

The lagoons abound in fish and enormous prawns, and are the resort of vast numbers of aquatic birds.

The depths all along the northern shore are very irregular, and sound-
 30 ing is the only guide when in its vicinity.

Chart 203, plan of Préveza strait.

Préveza strait.—The entrance to this strait, between Cape Skilla, page 131, and Fort Pandokrátor (Pantokrator), which is in ruins, on the coast, about 1½ miles north-north-westward, is easily distinguished
 35 from seaward by the white forts of Áktion, situated, at the north-eastern end of the strait, about 1½ miles north-north-eastward of Cape Skilla, and Pandokrátor (*Lat.* 38° 56' N., *Long.* 20° 45' E.). The strait is barred by a flat, with depths of less than 5 fathoms (9^m1) over it, the outer edge of which extends from about a mile westward of Cape Skilla
 40 to about half a mile westward of Fort Pandokrátor.

The bar consists of coarse sand and gravel covered with weed, apparently formed of deposits from the gulf banked up by the resistance of the sea. It is covered with small knolls of a darker shade than the bottom between them, and, being a little shallower, these are
 45 always perceptible when the sea is quite smooth. A submarine cable is laid across the strait, in a north-westerly direction, from Fort Áktion.

Khrisánthis channel, about 1½ miles long, leads in an east-north-easterly direction across the bar into depths greater than 6 fathoms
 50 (11^m0); the channel has a width of 140 feet (42^m7) and, in 1945, a least depth of 17 feet (5^m2). At the north-eastern end of Khrisánthis channel, Préveza strait trends north-north-eastward, with a width of about 1½ cables between the banks on either side, and leads into

Charts 1800, 2158b.

Chart 203, plan of Préveza strait.

Préveza bay between Forts Áktion and Paliosáraga (Paleosaraga), situated on a point about $3\frac{1}{2}$ cables north-westward.

Buoyage.—A conical light-buoy, exhibiting a *white flashing* light, is moored on the outer side of the bar, about a mile south-westward of Fort Pandokrátor. 5

Leading lights are exhibited; the front light about half a cable southward of Fort Áktion; the rear light about $3\frac{1}{2}$ cables east-north-eastward of the front light; these lights in line, bearing 066° , lead through Khrisánthis channel. 10

Khrisánthis channel is marked by buoys and light-buoys.

A light-buoy, exhibiting a *green flashing* light, is moored near the inner end of the channel, about $1\frac{1}{2}$ cables west-south-westward of the front leading light; this light-buoy marks the western edge of the shore bank, which has depths of less than 6 feet (1^m8) over it. 15

A conical buoy, painted in red and white stripes, is moored about $2\frac{1}{2}$ cables westward of the front leading light; this buoy marks the outer edge of the shallow bank extending about 2 cables from the north-western side of the strait.

A conical buoy is moored about a cable westward of a rock, with less than 6 feet (1^m8) over it, situated about 7 cables south-westward of the front leading light.

Khrisánthis channel is available for vessels drawing not more than 16 feet (4^m9) and should not be navigated without local knowledge.

Tidal streams.—The tidal streams frequently set over the bar at the rate of $2\frac{1}{2}$ knots, changing in direction every six hours, but with strong westerly or easterly winds, their strength and direction are irregular.

Préveza bay.—The eastern side of Préveza bay is formed by a bight between Fort Áktion and Ákri, a point, about three-quarters of a mile northward. The coastal bank, with depths of less than 5 fathoms (9^m1) over it, extends $1\frac{1}{2}$ cables from the head of the bight. Ákri (*Lat.* $38^\circ 57' N.$, *Long.* $20^\circ 47' E.$) is low and has a ruined tower on it; the point is bordered by a shallow bank, which, on its northern side, is three-quarters of a cable wide and, on its eastern side, is about a mile wide and, in 1907, was reported to be extending. The north-western 35 end of a tongue extending from the bank on the eastern side, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, lies about 3 cables north-eastward of Ákri. A vessel should exercise caution when rounding this point.

On the western side of Préveza bay, the town of Préveza extends along the coast between Forts Paliosáraga and VrISOúla, about a mile 40 northward.

The northern entrance of Préveza bay, whence the Gulf of Amvrakía is entered is about $1\frac{1}{2}$ cables wide, and lies between the south-eastern edge of Áyios Andréas (Fort Nuovo) shoal, which extends about 4 cables eastward from the northern end of the town and has depths of less than 2 46 $2\frac{1}{2}$ fathoms (4^m6) over it, and the bank extending off Ákri.

The south-western end of a detached breakwater, which has been constructed off the town, on the southern part of Áyios Andréas shoal, lies about 4 cables southward of Fort VrISOúla and close offshore, whence it extends about a cable north-eastward and then a cable 60 northward. The breakwater forms a small harbour in which the depths are from 2 to 15 feet (0^m6 to 4^m6).

Lights.—A light is exhibited, at an elevation of 13 feet (4^m0), from a white iron beacon, 10 feet (3^m0) in height, on Ákri.

Charts 1800, 2158b.

Chart 203, plan of Préveza strait.

Two lights, vertically disposed, are exhibited from the south-eastern corner of Fort Paliosáraga.

A light is exhibited, at an elevation of 29 feet (8^m8), from a red iron column, from the quay fronting the town of Préveza, close off the south-western end of the detached breakwater.

A light is exhibited, at an elevation of 12 feet (3^m7), from a red iron beacon, 10 feet (3^m0) in height, situated on the south-eastern edge of Áyios Andréas shoal.

10 A light is exhibited, at an elevation of 13 feet (4^m0), from a white iron beacon, 10 feet (3^m0) in height, situated near the northern end of the bank, about 3 cables east-north-eastward of the light-structure on Ákri.

Pilotage.—Pilotage is compulsory for all foreign merchant vessels.

15 **Anchorage.**—Vessels generally anchor outside Préveza strait, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), with Mítika, a bluff, cliffy cape, situated 5 miles north-north-westward of Cape Skilla, bearing 345°, and Áktion fortress bearing 075°, distant about 2 miles; the bottom is foul. A large vessel should anchor further out, in a depth of 20 about 11 fathoms (20^m1), mud, with Mítika bearing 348°.

The anchorage in Préveza bay is bounded on the western side by the walls of the town and on the eastern side, by the low sandy promontory terminating in Ákri (*Lat.* 38° 57' N., *Long.* 20° 46' E.). A fair berth is with the ruined tower on Ákri bearing 075°, and the south-eastern 25 bastion of the town bearing 202°, in a depth of about 48 feet (14^m6), mud.

There is a wharf at the town, about 60 yards (54^m9) long, with depths alongside of from 18 to 24 feet (5^m5 to 7^m3).

Préveza.—Communications.—Trade.—A plain, studded with 30 houses and interspersed with olive trees, extends northward and westward of the town of Préveza. Ague is very prevalent.

The population, in 1937, was 8,659.

There is steamer communication with Corfu and other ports.

The exports consist principally of olive oil, wool, butter, cheese and 35 valonia; the imports of cotton and woollen goods, petroleum and wine.

There are several lighters up to 70 tons each.

Chart 203, with plan of Préveza strait.

Western end of gulf.—Vathí bay is a narrow inlet, situated at the western end of the Gulf of Amvrakía, from a half to one mile northward 40 of Fort Vrisoúla. The entrance to this bay is very narrow between a shallow spit extending about three-quarters of a cable west-north-westward from the eastern entrance point and the edge of the shore bank on the western side. There are depths of 17 feet (5^m2) in the fairway of the entrance, whence the depths are somewhat greater until 45 within a cable of the head of the bay, where it is shallow. A short distance within the entrance, on the eastern side of Vathí bay, there are some ancient Roman ruins.

From the entrance of Vathí bay, for a distance of about 2 miles east-south-eastward, there is a sand and shingle beach in front of a low cliff 50 at the foot of some cultivated hills. The coastal bank, with depths of less than 2 fathoms (3^m7) over it, is about 4 cables wide near the middle of this stretch of coast.

Chart 203.

About half a mile further south-eastward and beyond the sand and

Charts 1800, 2158b.

Chart 203.

shingle beach, there is a small shallow bay. On the north-eastern side of this bay is the entrance to a lagoon.

Cape Laskára, situated about half a mile south-eastward of the entrance to this lagoon, is the southern termination of a peninsula projecting about $3\frac{1}{2}$ miles east-south-eastward. The peninsula is about half a mile wide at its eastern end, which is 469 feet (143^m0) high and has three distinct points of which Cape Laskára is the southern, Cape Skafidhákí (Skaphidaki), about half a mile north-eastward, is the eastern, and Cape Mirtávi (Myrtavi), about three-quarters of a mile further northward, is the northern.

Gáidharos, a rocky islet, lies about $3\frac{1}{2}$ cables north-eastward of Cape Skafidhákí; this islet is closely fringed by above-water and sunken rocks.

On the southern side of the western end of the Gulf of Amvrakía there is a bight between Ákri, page 133, and Cape Panayía (Panagia), about $4\frac{1}{2}$ miles eastward. The coast, for about 3 miles south-eastward of Ákri, is low and sandy; farther on it begins to assume a hilly aspect, and the south-eastern side of the bight, forming the western side of a bold, precipitous tongue of land terminating in Cape Panayía, is indented. The shore bank extending eastward of Ákri, mentioned on page 133, gradually decreases in width, until it terminates about 4 miles south-eastward of Ákri; the outer edge of this bank is steep-to.

Kéfalos (Kephalos), an islet, lies about half a mile north-eastward of Cape Panayía, and is connected to it by a bank, over which the depths are uneven and less than 10 fathoms (18^m3). A bank, with less than 6 feet (1^m8) over it, extends about a cable from the north-eastern side of Cape Panayía. Kéfalos is bordered by a shallow rocky bank about 2 cables wide on its north-western and north-eastern sides and somewhat narrower on its south-western side. An above-water rock lies on this bank close off the north-western end of the islet. A vessel is recommended not to use the narrow channel between the islet and the cape.

Lights.—The light on the bank eastward of Ákri is described on page 134.

A light is exhibited, at an elevation of 39 feet (11^m9), from a white iron column, 19 feet (5^m8) in height, on Cape Laskára (*Lat.* 38° 57' N., *Long.* 20° 50' E.). This light was reported, in 1945, to be damaged.

A light is exhibited, at an elevation of 19 feet (5^m8), from a white iron beacon, 10 feet (3^m0) in height, on Cape Panayía.

Salaóra bay.—**Off-lying danger.**—Salaóra bay is situated at the north-western end of the Gulf of Amvrakía and is entered between Cape Mirtávi, mentioned above, and Cape Salaóra, about 4 miles north-north-eastward.

On the south-western side of the bay, between Cape Mirtávi and a point about $3\frac{1}{2}$ miles north-westward, the coast is precipitous. Between the last-mentioned point and the western entrance point of the Louros river, which is low and has a tower on it, about 3 miles northward, there is a bight with a sandy shore. This portion of the coast is bordered by a shallow bank about 3 cables wide. In the southern part of the bight there are some inlets leading into Mázoma lagoon. The ruins of Nikópolis, page 132, can be seen across the lagoon. Northward of Mázoma lagoon, a ridge from the hills northward of Nikópolis, with grassy cliffs and a beach at their foot, slopes down to the shores of the bay.

Charts 1800, 2158b.

Chart 203.

On the north-eastern side of the bay, Cape Salaóra rises to an elevation of 272 feet (82^m9); Lake Tsoukalió is situated westward and north-westward of Cape Salaóra and is fronted by a narrow sandy beach, through which there are several openings. The beach ends about 4 miles west-north-westward of the cape, and the eastern entrance point of the Louros river is situated about half a mile further south-westward. From a position on the coast, about 1½ miles westward of the light-beacon on Cape Salaóra, depths of less than 4 fathoms (7^m3) extend 1½ miles offshore and a detached shoal, with a depth of 2½ fathoms (5^m0) over it, lies 1½ miles south-westward of the light-beacon and about a mile offshore.

About 2 cables eastward of the light-beacon, there is a pier, the head of which is situated in a small area, dredged through the coastal bank, to a depth of 3½ fathoms (5^m9).

The mouth of the Louros river is situated at the head of Salaóra bay; it is a rapid stream flowing through a swamp westward of Lake Tsoukalió. About 7 miles above its mouth, where there is a ferry, the river is 100 yards (91^m4) wide. The coastal bank, with less than 2 fathoms (3^m7) over it, extends about a mile east-south-eastward of the mouth of the river.

Light.—Anchorage.—A light is exhibited, at an elevation of 29 feet (8^m8), from a white iron beacon, 10 feet (3^m0) in height, on Cape Salaóra.

Anchorage may be obtained, in depths of from 3½ to 4 fathoms (6^m4 to 7^m3), about half a mile offshore, southward of Cape Salaóra (*Lat.* 39° 02' N., *Long.* 20° 53' E.).

Coast.—Lake Logarós lies eastward of Cape Salaóra, separated from the Gulf of Amvrakía by a narrow, sandy beach, through which there are entrances, and which extends south-eastward for 3 miles from the cape and then north-eastward for 2 miles. The coastal bank, with depths of less than 2 fathoms (3^m7) over it, is about 4 cables wide off this beach, but extends for a distance of about 1½ miles off its southern end. The Kórakas islands, five in number and consisting wholly of soil, lie on the coastal bank southward of the beach; Voúvalos, the largest and southernmost of these islands, is situated on the southern edge of the bank, about 2½ miles north-eastward of Kéfalos islet, page 135.

Cape Palmateró, which is low, lies about 3½ miles east-north-eastward of Voúvalos; between Cape Palmateró and the beach at the eastern end of Lake Logarós, the coast is indented and bordered by a shallow bank about half a mile wide off the salient points. A spit, with depths of less than 2 fathoms (3^m7) over it, and which dries in places, extends about 1½ miles south-south-eastward of Cape Palmateró.

Light-buoy.—A conical light-buoy, exhibiting a *red flashing* light, marks the south-western extremity of the spit extending from Cape Palmateró.

Vónitsa bay.—This bay is situated near the western end of the southern side of the Gulf of Amvrakía, and is entered between Cape Panayía, page 135, and Cape Yeládha (Gelada), about 2½ miles east-south-eastward. It presents a view of an extensive valley stretching southward, bounded on either side by steep wooded mountains and watered by several streams, shaded by plane trees.

On the western side of the bay, Áyios Márkos bay is entered about 1½ miles south-south-eastward of Cape Panayía, and Amvrakía lake,

Chart 203.

which is shallow and has a very narrow entrance, is situated about three-quarters of a mile further south-south-eastward.

On the eastern side of the bay, there is a bight between Cape Yeládha and a point about a mile southward. The coast here and for a distance of about half a mile further south-south-westward is steep-to and backed by the northern and north-western slopes of Mount Amadherós, 1,575 feet (480^m1) high, which stands about 2 miles southward of Cape Yeládha.

The town of Vónitsa, where there is a short mole, is situated on the western side of the head of the bay; a fort stands on a steep, rocky hill, close westward of the town. Between the entrance to Amvrakía lake and a point about 1½ miles eastward, there are two bights, separated by a projection; Koukouvítsa, a low islet, lies close off this projection on a shallow bank which extends about 3 cables northward of it.

Depths of less than 5 fathoms (9^m1) extend about 2 cables offshore abreast the town and about 4 cables from the head of the eastern bight. A ridge, with depths of 3½ fathoms (5^m9) over it, extends about half a mile north-north-eastward of Koukouvítsa.

There is anchorage about half a mile northward of the town, in a depth of 7 or 8 fathoms (12^m8 or 14^m6), or at any convenient distance.

There are a customs house and a military hospital at Vónitsa.

Light.—A light is exhibited, at an elevation of 22 feet (6^m7), from an iron column, 16 feet (4^m9) in height, on the mole head at Vónitsa (*Lat.* 38° 55' N., *Long.* 20° 55' E.).

Coast.—Between Cape Yeládha and Cape Volími (Volymi), 2½ miles east-south-eastward, there is a bight, the coast of which is bold, but fringed close inshore by sunken rocks. The south-western side of this bight is steep-to; at the head of the bight, where there are the mouths of several streams, the coast is low and swampy and fringed by a narrow, shallow bank. The south-eastern side of the bight is fringed by a similar bank but the coast is not so high as that on the south-western side. The land here, in several places, is thickly covered with low trees and brushwood.

Roúga bay is entered between Cape Volími and Cape Khalíki (Kaliki), about 2½ miles south-eastward; its shores are fringed by a narrow, shallow bank, on which, on the western side of the bay, there are some sunken rocks in places. Cape Khalíki, though low and sandy, is steep-to; the land rises to an elevation of 220 feet (67^m1), about three-quarters of a mile southward of the cape. There is a small lake at the head of this bay.

Eastern end of gulf.—On the northern side of the eastern end of the Gulf of Amvrakía, the mouth of the Árakthos river is situated about 3½ miles eastward of Cape Palmateró, page 136, at the extremity of the northern of two arms of a low projection, the extent of which can best be seen on the chart. A shallow bank, parts of which dry, extends about 6 cables southward and 2½ cables eastward, of the river mouth, and is covered by the red sector of Cape Kópraina light between the bearings of 010° and 180°. The mouth of the river is liable to shift and a vessel should be guided by sounding when in the vicinity.

Árakthos river is usually navigable by boats for about 4 miles and, sometimes, as far as the town of Árta, described on page 139, a distance of about 9 miles north-north-westward of the mouth. There are several villages on its banks.

Chart 203.

On the southern side of the gulf, from Cape Khalíki, page 137, the coast, fringed by a narrow, shallow bank, trends southward for about $1\frac{1}{2}$ miles to the northern entrance point of Paliómilos (Paleomylos) bay. 5 The entrance to Paliómilos bay is about half a mile wide, and a shallow bank, about 3 cables wide, extends from its head. There is good anchorage in a depth of 5 fathoms (9^m1), mud, about 3 cables southward of the northern entrance point.

From the head of Paliómilos bay to Loutráki village, about 3 miles 10 eastward, the coast is low and fringed by a narrow, shallow bank, broken by the mouths of several streams; inland, the country is low and swampy for a considerable distance beyond which it rises in steep, rugged mountains with deep chasms between.

Loutráki bay is entered between a point, about 3 miles east-south- 15 eastward of the northern entrance point of Paliómilos bay, and a point about $1\frac{1}{2}$ miles south-westward. A narrow inlet is situated in the southern portion of Loutráki bay; the entrance to this inlet, between Loutráki village and a point about 4 cables north-eastward is not easily distinguished. The sides of the inlet are bounded by steep hills and 20 along the southern shore there is a shingle beach.

The coast gradually declines in height towards Makriamíti, a cape, situated about $1\frac{1}{2}$ miles north-north-eastward of the northern entrance point of Loutráki bay. The coast here is steep, cliffy and fringed close inshore by sunken rocks, with a few sandy beaches where boats can 25 land, and can be approached to a prudent distance. The country in the vicinity of Makriamíti has a rocky, sterile appearance, but it is covered with stunted shrubs, with a few trees here and there.

Off-lying danger.—Aléxandros reef, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, lies about 2 miles east-north-eastward of Cape Khalíki 30 (*Lat. $38^\circ 56'$ N., Long. $21^\circ 03'$ E.*); it lies in the *white* sector of Cape Kópraina light, bearing 010° and less.

Karvasará bay.—This bay is situated at the south-eastern end of the Gulf of Amvrakía, at the head of an extensive inlet which is entered between Makriamíti and the foot of Mount Katsagríli, 318 feet (96^m9) 35 high, about $2\frac{1}{2}$ miles north-eastward. The south-western side of the inlet, between Makriamíti and Cape Áyios Yeóryios (Phano), about $2\frac{1}{2}$ miles south-eastward, is indented and steep-to. Cape Dervisa lies about half a mile eastward of Makriamíti. The eastern side of the inlet, between Mount Katsagríli and the southern end of a small pro- 40 jection, about 2 miles south-south-eastward, is low and swampy, and a shallow bank extends about 3 cables offshore in places. The village of Vlókha is situated on the coast close southward of Mount Katsagríli.

Karvasará bay is entered between the projection just mentioned and Cape Áyios Yeóryios, about three-quarters of a mile south-south- 45 westward. Almirós bay, which is small, shallow, and open southward, lies close eastward of the projection. The sides of Karvasará bay are steep and the depths in the bay are considerable except at its head where there is a narrow spit, with a depth of 10 feet (3^m0) over its outer end, which extends about 2 cables offshore. The end of this spit is 50 reported to be the head of an occasionally active volcano. Captain A. Miaulis, of the Greek Royal Navy, reported in 1875, that two eruptions were known to have taken place, one in November, 1847, the other in February, 1865. Fish were then destroyed in great numbers, and the sea covered with sulphur, which floated as far as Préveza.

Charts 1800, 2158b.

Chart 203.

At the head of Karvasará bay, near the town of Amfilokhía (Karvasaras) and at the beginning of a deep glen, are the ruins of an ancient city. The ruins consist of two walls ascending the hill from the beach; the principal part of the ruins surround the summit of the hill in a circular form, with numerous square projecting towers.

The neighbourhood of Karvasará bay is reported to be the most healthy in the Gulf of Amvrakía, as it is not subject to the malaria prevalent elsewhere.

There is a customs house at Amfilokhía and the town is in regular communication by coasting steamers with other ports.

Lights.—A light is exhibited, at an elevation of 36 feet (11^m0), from an iron column on a hut, 16 feet (4^m9) in height, on Cape Dervisa (*Lat.* 38° 54' N., *Long.* 21° 08' E.).

A light is exhibited, at an elevation of 45 feet (13^m7), from an iron column, 19 feet (5^m8) in height, on Cape Áyios Yeóryios.

A light is exhibited on the mole at Amfilokhía.

Coast.—From the northern end of Mount Katsagrli to the southern end of Mount Makrí (Makrynoros ridge), about 2½ miles northward, the coast is low and fringed by a narrow, shallow bank; the country within is low and swampy. The village of Arápis is situated on the southern side of the mouth of a stream close northward of Mount Katsagrli, and Katáfrikos (Kataphrikho) lake lies just within the coast from one to 2 miles north-north-eastward of Arápis.

From the southern end of Mount Makrí, the coast is formed by the base of that mountain for the distance of about 3 miles north-north-westward; the coast here is steep-to, and in most places inaccessible, except at the foot of the deep ravines between the hills, where a small sandy cove may permit a boat to beach.

At the north-eastern end of the Gulf of Amvrakía, there are two bights between the base of Mount Makrí and the mouth of the Árakthos river, page 137, divided by Cape Kópraina, the termination of a projection, about 1½ miles north-north-eastward of the river mouth. The south-western bight is shallow. Kópraina anchorage is situated in the north-eastern bight; at the head of this bight, there is a shallow bank, about 4 cables wide, which is separated from an extensive fishery, northward, by a narrow strip of coast.

Árta.—This town, mentioned on page 137, is the capital of a department, and is situated on the eastern bank of the Árakthos river.

The population of Árta, in 1937, was 7,468. There is a hospital in the town.

There is regular steamer communication with other ports from the village of Kópraina, situated about three-quarters of a mile northward of Cape Kópraina.

Light.—A light is exhibited, at an elevation of 33 feet (10^m1), from a circular masonry tower and dwelling, 29 feet (8^m8) in height, on Cape Kópraina.

COAST.—Between Fort Pandokrátor, page 132, and Mítika, a bluff and clifty cape, about 4 miles north-north-westward, the land is covered with trees; the coast is clifty with a sandy beach, and is fringed by a shallow coastal bank, on which there are sunken rocks in places, and which is about 3 cables wide at its southern and northern ends. An

Charts 1800, 2158b.

Chart 203.

islet lies on the coastal bank about a quarter of a mile south-westward of Mítika and a cable offshore. A bank, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over its outer end, which is steep-to, extends about three-quarters of a mile westward of the cape; a detached $1\frac{1}{2}$ -fathom (2^m3) patch lies about 3 cables northward, and a rock, awash, about $1\frac{1}{2}$ cables north-eastward of the cape (*Lat.* $39^\circ 00' N.$, *Long.* $20^\circ 43' E.$).

Nikópolis bay, which is small and shallow, with the village of Mítika at its head, lies on the eastern side of Mítika.

- 10 Between Mítika and Cape Kastrosikiá, about $6\frac{1}{2}$ miles north-north-westward, there is a bight with a sandy beach through which several streams flow into the sea, and which, from a position about 2 miles northward of Mítika, is backed by a chain of hills. The southern part of the bight is separated from Salaóra bay, page 135, by an isthmus
- 15 about 2 miles wide. Mikhalítsi, a hill, stands about $2\frac{1}{2}$ miles north-eastward of Mítika and overlooks the southern part of the bight; and the village of Kanália stands on the slope of the hills near the middle of the bight. The remains of an ancient mole project 2 cables offshore about $1\frac{1}{2}$ miles north-north-eastward of Mítika; between that cape and
- 20 the mole, uneven depths of less than 5 fathoms (9^m1) extend about 6 cables offshore.

- Cape Kastrosikiá is a low, slightly projecting, red bluff, and the termination of the southern slope of Mount Zálongon (Zarothema), 3,002 feet (915^m0) high about 6 miles northward. There is a beach on
- 25 both sides of Cape Kastrosikiá, and a rocky bank, which is steep-to, extends about three-quarters of a mile south-westward and southward of the cape; an islet lies near the outer edge of this bank, south-westward of the cape and Itissa (Ittisa) reef, part of which is awash, lies at the southern end of the bank. A rock, awash, which is steep-to on
- 30 its western side, lies detached, about three-quarters of a mile west-north-westward of Cape Kastrosikiá and 4 cables offshore. The village of Kastrosikiá lies half a mile north-north-eastward of the cape.

- There is anchorage, with offshore winds, west-north-westward of Mikhalítsi hill, about half a mile offshore, in a depth of 10 or 11 fathoms
- 35 (18^m3 or 20^m1); farther off, the depths increase rapidly. Small vessels, with local knowledge, sometimes anchor in the shallow bay eastward of Cape Kastrosikiá, sheltered from westward by Itissa reef; there is a customs house here.

- The ruins of Rizó fort (Castel Riniassa) are situated on a limestone
- 40 rock, 535 feet (163^m1) high, a short distance inland, about 3 miles north-westward of Cape Kastrosikiá; the fort has apparently been destroyed by an earthquake splitting the entire hill, leaving a deep, perpendicular chasm dividing the fort longitudinally.

Chart 206.

- 45 For a distance of about $10\frac{1}{2}$ miles north-westward of Cape Kastrosikiá, the coast consists of sandy beaches separated by small projections, thence for a mile further northward, to the southern entrance point of Fanári (Phanari) harbour, the coast is rocky. From Cape Kastrosikiá to 2 miles southward of Fanári harbour, a bank, over which there are
- 50 depths of 4 fathoms (7^m3) and less, extends as much as 6 cables offshore in places. There are some sunken rocks on this bank, lying close offshore; the detached rock, awash, about three-quarters of a mile west-north-westward of Cape Kastrosikiá, has already been mentioned.

Kerétza roadstead is situated in a small bay, about $1\frac{1}{2}$ miles south-

Charts 203, 1800, 2158b.

Chart 206.

ward of the southern entrance point of Fanári harbour (*Lat.* 39° 14' N., *Long.* 20° 30' E.).

Chart 206, plan of Port Phanari.

Fanári harbour.—The entrance to this harbour is about 1½ cables wide between its southern and northern entrance points, and is exposed to south-westerly winds. The position of the harbour may be identified from seaward by the ruins of a castle on a hill, 2½ miles eastward of the entrance; also by the wedge-shaped cliffs on either side.

The southern entrance point is a tongue of land projecting northward, 75 feet (22^m9) high, with a chapel on its summit. The northern entrance point is 50 feet (15^m2) high; its sea face, for a distance of about half a mile northward, is fringed by sunken rocks; one rock, 6 feet (1^m8) high, lies a quarter of a mile northward of the point and half a cable offshore; another above-water rock, which is grey, lies close offshore about a cable north-north-westward of the point.

The southern, eastern and northern shores of the harbour consist of a sandy beach from which a shallow bank stretches more than half way across the harbour.

The Akhéron (Gurla) river flows into the south-eastern part of the harbour; this is a considerable stream, it has a depth of 2 feet (0^m6) over the bar, but boats can ascend some distance.

The village of Fanári lies on the eastern side of the harbour.

The anchorage is from 1½ to 2 cables north-eastward of the northern entrance point, and about a cable offshore, in a depth of 5½ fathoms (10^m1). There is also temporary anchorage in fine weather during summer, at a distance of 3 cables south-westward of the entrance, in a depth of 10 fathoms (18^m3); outside this the depths increase rapidly.

The stream generally runs out of Fanári harbour at the rate of about 1½ knots, but it is much stronger during the rainy season.

Chart 206.

Coast.—The coast between the northern entrance point of Fanári harbour and the south-eastern entrance point of Áyios Ioánnis (S. Giovanni) harbour, about 1½ miles northward, consists of high, red, rocky cliffs and is free from offshore dangers.

Chart 206, plan of Port S. Giovanni.

The entrance of Áyios Ioánnis harbour (*Lat.* 39° 16' N., *Long.* 20° 29' E.) is about half a mile wide and the harbour is open southward. Its shores are backed by high limestone hills, and its north-eastern side is fringed by a bank, about a cable wide, with a depth of less than 5 fathoms (9^m1) over it, and on which there are above-water and sunken rocks lying close offshore.

Small vessels anchor, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), in Skoulíki (Skuluki) anchorage, situated off a cove about 4 cables northward of the north-western entrance point, where they also moor, but the best anchorage, with northerly winds, is in the middle of the harbour, in a depth of 13 fathoms (23^m8), mud.

A short distance within the harbour and about a cable offshore, there is a remarkable fresh-water spring, rising from a depth of 12 fathoms (21^m9).

Between the north-western entrance point of Áyios Ioánnis harbour and Cape Pogoniá (Pogogna), about 1½ miles westward, there is a bight.

Chart 206, plan of Port Parga.

Párga harbour.—**Light.**—Párga harbour lies in the north-western

Charts 206, 1800, 2158b.

Chart 206, plan of Port Parga.

part of the bight between Cape Pogoniá and Cape Keladhió (Keladio), about $1\frac{1}{2}$ miles west-north-westward. Áyios Nikólaos, an islet, 50 feet (15^m2) high, with a chapel on its summit, lies 2 cables south-south-
 5 westward of Cape Pogoniá.

Cape Keladhió is steep, rugged, and 173 feet (52^m7) high; there is a conspicuous tower on the cape, which is a portion of the ruined monastery of Áyios Spirídhon. An islet lies close south-westward of Cape Keladhió, and Spirídhon reef, awash, lies about half a cable south-
 10 eastward of the cape. The harbour is entered between Spirídhon reef and the south-westernmost of the Toúrkika (Turkika) rocks, about $3\frac{1}{2}$ cables east-north-eastward. Toúrkika rocks, above-water, lie on a detached, shallow, rocky bank which extends about a quarter of a cable south-westward and half a cable north-westward and north-
 15 eastward of the south-westernmost rock.

Párga harbour is divided into two bays by a conical, rocky projection, 263 feet (80^m2) high, on which stands Párga fortress. The larger bay, westward of the projection and open southward, has a sandy beach at its head and the remains of an ancient mole on its south-western side;
 20 the anchorage is in a depth of 7 fathoms (12^m8), mud, about $1\frac{1}{2}$ cables west-south-westward of the light-structure south-westward of the fortress.

The bay south-eastward of the projection, though open south-westward, is protected from the sea by a group of islets lying on a tongue of
 25 the coastal bank, with depths of less than 5 fathoms (9^m1) over it, which extends offshore in this vicinity for a distance of about a quarter of a mile. Pavlóukes (Madonna), the southernmost of the islets, is 33 feet (10^m1) high; the islet situated close westward of it, lies about half a cable east-north-eastward of the bank on which lie the
 30 Toúrkika rocks, with uneven depths between. There is a lazaretto on one of the islets. Cape Áyios Anastásios, on which there is a chapel, is situated on the mainland, about $2\frac{1}{2}$ cables north-eastward of Pavlóukes. A jetty, with a depth of about 5 feet (1^m5) at its head, is situated at the head of this bay. This jetty was reported, in 1945, to be in ruins.
 35 A light is exhibited, at an elevation of 79 feet (24^m1), from a white iron column on a concrete base, on the south-western side of Párga fortress (*Lat.* $39^\circ 17' N.$, *Long.* $20^\circ 25' E.$).

Both bays are suitable only for small vessels, and those with local knowledge, usually prefer the south-eastern.

40 During fine summer weather, a vessel may find temporary anchorage off Párga harbour, $4\frac{1}{2}$ cables from the summit of Párga fortress, with Cape Keladhió bearing 284° , in a depth of about 20 fathoms (36^m6), mud.

The town of Párga is situated on the projection separating the two
 45 bays.

Chart 206.

Coast.—Between Cape Keladhió and Sívota, an island, lying close offshore about 10 miles north-westward, the coast is rocky, with a few sandy bays; it is clear of dangers and rises inland in high rugged ridges
 50 partially wooded, which, within a mile of Cape Varlám, situated about 4 miles west-north-westward of Cape Keladhió, attain an elevation of 1,656 feet (504^m7). The depths are considerable at the distance of half a mile off this stretch of coast.

Cape Varlám is not a salient point; Ombrélla, an islet, lies about

Charts 1800, 2158b.

Chart 206.

2 cables north-westward of it and close offshore. This islet is situated on the narrow bank, with depths of 4 fathoms (7^m3) over it, which fringes the coast from about one mile south-eastward to 2 miles north-westward of the cape.

The mouth of the Paramithiá river is situated at the head of a small bay about 2 miles north-north-westward of Ombrella; Aríla (Arilla) bay, open westward, lies from one to 1½ miles northward of the mouth of this river and the village of Aríla is situated, a short distance inland from the head of the bay, on the southern slope of Giutséki, an isolated hill, 1,104 feet (336^m5) high.

Pérdhika bay lies from three-quarters of a mile to 1½ miles north-north-westward of Aríla bay. Kátso, an islet, lies close off the southern entrance point of this bay and Pérámos, another islet, close off its northern entrance point.

Móurtos bay lies between a point on the coast abreast Pérámos islet and the southern extremity of Megálo Mourteméno, a peninsula, about 1½ miles north-westward; Mikró Mourteméno, an islet, lies close off the south-eastern side of this peninsula. Another peninsula, fringed by sunken rocks in places, projects southward from the coast about half a mile eastward of Megálo Mourteméno, forming a small bay; an above-water rock is situated near the middle of this bay, a short distance within the entrance.

Sívota, an island, lies with its southern extremity about a quarter of a mile west-north-westward of Megálo Mourteméno; this island is rocky, 384 feet (117^m0) high, thickly wooded, and conspicuous on account of its dark colour; the depths are considerable at the distance of half a mile westward of the island.

Áyios Nikólaos, an island, 237 feet (72^m2) high, lies between Sívota and the mainland north-eastward. The southern ends of these islands are connected by a reef, but there is a narrow channel, in the southern part of which there is a depth of only 2 fathoms (3^m7), between Áyios Nikólaos and the mainland. On the eastern side of this channel there is an inlet, at the head of which lies the village of Móurtos (Mourzo), where there is a customs house.

Light.—A light is exhibited, at an elevation of 282 feet (85^m9), from a white tower and dwelling, situated about a cable within the north-western extremity of Sívota (*Lat.* 39° 24' N., *Long.* 20° 14' E.).

Off-lying islands.—**Light.**—Paxoi, a group of two islands and several islets and rocks, lie off the stretch of coast just described.

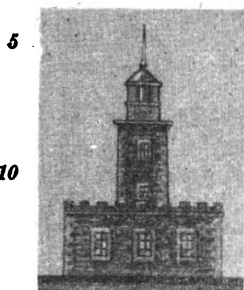
Andípaxoi (Anti-Paxos), the south-eastern island, is situated with Cape Ovoróu (Novara), its south-eastern extremity, about 10 miles south-westward of Cape Keladhió; the island is generally level, but rises near its northern end to an elevation of 351 feet (107^m0). Its coast is fringed by a narrow bank with a few rocks lying close offshore; at the northern end of the island, the coastal bank is 2 cables wide and has a depth of 2 fathoms (3^m7) over it. Dhaskália (Vascaglia Plakka), an islet, lies about half a mile southward of Cape Ovoróu; a reef, on which there are some above-water rocks, extends about half a mile east-south-eastward of Dhaskália. An above-water rock lies midway between Dhaskália and Cape Ovoróu. These islets and rocks are covered by the red sector of Cape Ovoróu light between the bearings of 307° and 036°.

On the north-eastern side of Andípaxoi, there is a small bay

Charts 1800, 2158b.

Chart 206.

near the only village, where small vessels, with local knowledge, can secure.



Cape Ovorou Lighthouse.

A light is exhibited, at an elevation of 136 feet (41^m4), from a square masonry tower and dwelling, 39 feet (11^m9) in height, on Cape Ovorou (Lat. 39° 08' N., Long. 20° 16' E.). See view.

Paxoi (Paxo), an island, lies north-westward of Andipaxoi, from which it is separated by a passage about a mile wide, in which there are strong eddies. Depths shoaler than charted were reported, in 1945, to exist in the middle of this passage, about 6 cables north-westward of the northern extremity of Andipaxoi.

Paxoi is in general flat and covered with dense olive plantations; its summit is 807 feet (246^m0) high; its coasts are bold, particularly on the western side, which rises in steep white cliffs. Kálkio (Kalkonisi), an islet, lies about 2 cables eastward of the south-eastern extremity of Paxoi, with the southern end of Móngo, another islet, between. Gáios, on the eastern side, is the principal town; there are also several villages amidst thick olive groves. See view C on chart 206, and the view facing this page.

Chart 206, plan of Port Gayo.

Gáios harbour.—Lights.—Gáios (Gayo) harbour lies at the head of a bight on the north-eastern side of Paxoi, between a point, about a mile north-westward of the south-eastern extremity of the island, and Cape Yeromónakho, about three-quarters of a mile further north-westward; it is sheltered by two islets. Áyios Ioánnis (Citadel), the south-western islet, on which there is a fort, lies near the head of the bight, separated from the coast by a narrow, shallow, well-sheltered creek. Áyios Nikólaos church, the cupola of which is conspicuous, stands near the southern end of this islet. Panayía (Madonna) islet, lies about three-quarters of a cable north-eastward of Áyios Ioánnis, connected to it by a bank, with depths of 2½ fathoms (4^m6) over it. An above-water rock lies close north-eastward of Panayía, on the coastal bank which extends half a cable offshore in this direction. A detached 5-fathom (9^m1) patch lies about 1½ cables north-eastward of Cape Yeromónakho.

Small vessels, with local knowledge, using the creek have to haul close inshore and moor head and stern. The depths are greater between Áyios Ioánnis and the coast north-westward.

The town of Gáios is built along the shore of the creek, and along the sea face of the town, there is a wharf, with a depth of 10 feet (3^m0) alongside. At the southern entrance of the creek, there are two short moles, one extending southward from Áyios Ioánnis, and the other northward from the coast opposite; the entrance between the heads of these moles is very narrow.

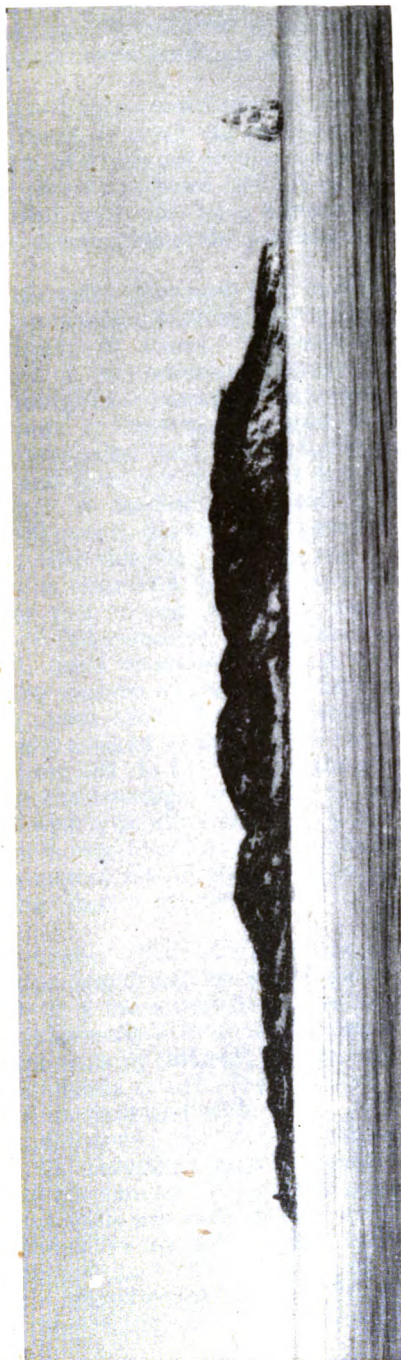
A light is exhibited, at an elevation of 85 feet (25^m9), from a white square masonry tower and dwelling, 26 feet (7^m9) in height, on the summit of Panayía islet (Lat. 39° 12' N., Long. 20° 13' E.).

A light is exhibited from each molehead at the southern entrance of Gáios harbour.

Chart 206.

Port Longós.—The port of Longós is in a small bay, open to easterly

Charts 203, 1800, 1440, 2158b.



*Lighthouse
(destroyed 1913).*

Paxos island from the north-north-westward, distant 5 miles.

(Original dated 1892.)

Chart 206.

winds, about three-quarters of a mile west-north-westward of Cape Yeromónakho. There was, in 1937, a depth of about 26 feet (7^m9) at a distance of about a cable from the head of the bay. A small jetty, with a depth of about 19 feet (5^m8) alongside, projects from the southern side of the bay and some buildings stand on the southern and western shores.

Port Láikka.—This port, situated on the eastern side of the northern extremity of Paxoi, is small, its entrance being about a cable wide. There are depths of 3 fathoms (5^m5) in a small area near the head of the port, but only about 2 fathoms (3^m7) in the approach to it; it is only suitable for small craft with local knowledge. A small pier projects from the north-eastern side of the port and there are a few houses at its head.

Danger.—Marmára (Marmorì) reef, on which there are some above-water rocks, one of which is 25 feet (7^m6) high, lies close off the north-western extremity of Paxoi. The reef extends about 1½ cables north-westward of the outermost above-water rock.

Off-lying dangers.—Panayía (Madonna) reef lies from about 2 to 2½ miles eastward of Panayía islet lighthouse (*Lat.* 39° 12' N., *Long.* 20° 20' 13' E.). Its shoalest head, which sometimes dries, is situated on the western side, and there is a depth of 5 fathoms (9^m1) over the eastern end of the reef. A detached shoal, with depths of 7 and 8 fathoms (12^m8 and 14^m6) over it, lies about a quarter of a mile south-eastward of Panayía reef; with this exception, the reef is steep-to and the channel on either side is clear and deep. A sailing vessel should avoid the vicinity of the reef on account of the current.

Mount Mávro (Mavronoros), bearing 354° and just open westward of Sívota island, leads westward of Panayía reef; Cape Rodhováni (Rodovari), the western extremity of Andípaxoi, in line with Káلكio islet, bearing about 188°, also leads westward of it.

Panayía reef is covered by the *red* sector of Cape Ovoroú light between the bearings from 167° to 185° and by the *green* sector of Panayía islet light between the bearings from 256° to 277°.

Paxoi reef, with a depth of less than 6 feet (1^m8) over it, lies about 1½ miles north-westward of Panayía islet lighthouse and about 4 cables off the north-eastern side of Paxoi. Close offshore, abreast this reef, there are some above-water rocks.

CORFU.—Corfu, called Kérkira by the Greeks, is the most important of the Ionian islands and lies with Cape Áspro (Bianco), its southern extremity, about 5 miles west-south-westward of Sívota island lighthouse. It was formerly a Venetian possession; it was occupied during the Napoleonic wars by different belligerents and was assigned as one of the Ionian islands to British protection by the treaty of Vienna; it was finally incorporated with Greece in 1864.

Corfu is mountainous and covered with olive plantations. Mount Pandokrátor (St. Salvador), about 26 miles north-north-westward of Cape Áspro, is the summit of the northern ridge and has two remarkable peaks, one 3,002 feet (915^m0) high, and the other, about 1½ miles south-westward, 2,786 feet (849^m2) high, with a flat tableland between; its sides are precipitous, thickly wooded and cut up by deep ravines and watercourses. Mount Áyios Yeóryios (St. Giorgio), 1,288 feet (392^m6) high, stands close to the coast on the western side of the island, about

Charts 203, 1800, 2158b.

Chart 206.

9 miles south-south-westward of Mount Pandokrátor and Mount Áyioi Dhéka (Santa Decca), 1,890 feet (576^{m1}) high, stands about 16 miles north-westward of Cape Áspro (*Lat.* 39° 21' N., *Long.* 20° 08' E.).

- 5 The population of Corfu island, in 1937, was 106,251.

The principal exports are oil, olives, wine and soap; the imports are cereals, coal, cotton, tin, cattle, woollen fabrics, &c.

Communication.—There is steamer communication with other Greek ports.

- 10 **Caution.**—In 1939, navigation was controlled by the Greek government in an area round Corfu and its adjacent islands, extending to a distance of a mile offshore.

- South-western side of Corfu.—Dangers.**—Cape Áspro is about 330 feet (100^{m6}) high, and about 1½ miles north-westward of it, there is
15 a hill, 481 feet (146^{m6}) high. The cape is composed of white cliffs. See view C on chart 206 and the views facing this page.

- Cape Áspro is fringed by a shallow rocky bank and a bank, with uneven depths of less than 20 fathoms (36^{m6}) over it, extends 4½ miles south-eastward of it. There are 4-fathom (7^{m3}) patches on this bank,
20 one situated about 2 miles east-north-eastward, and another 1½ miles south-south-eastward of the cape and there is a 1½-fathom (2^{m7}) patch about three-quarters of a mile south-westward of the cape. Depths shoaler than charted were reported, in 1945, to exist about 4 miles east-south-eastward of Cape Áspro. The south-western peak of
25 Mount Pandokrátor, bearing 324°, and well open north-eastward of the citadel at the town of Corfu, leads close north-eastward of the dangers on this bank.

- Cape Megákhoro (Maga Khoro), about 5½ miles west-north-westward of Cape Áspro, is low, and, like the intervening coast, is bordered by
30 a rocky bank. About three-quarters of a mile south-westward of Cape Megákhoro, there is a one-fathom (1^{m8}) rocky patch; and half a mile southward of this patch, there is a rocky bank, with a depth of 8 fathoms (14^{m6}) over it, which is steep-to.

- Cape Kónsia, which is low, lies about 4½ miles north-westward of
35 Cape Megákhoro; a shallow bank about half a mile off Cape Kónsia. Lagóúdhia (Lagudia) rocks, above-water and two in number, are situated on the coastal bank which extends 1½ miles south-south-westward and southward of the cape, and a reef, on which some of the rocks are above water, lies near the southern end of the bank.

- 40 Vessels, with local knowledge, frequently anchor off the coast between Capes Áspro and Kónsia, in depths of from 9 to 10 fathoms (16^{m5} to 18^{m3}), fine sand, sheltered from the strong north-easterly winter gales.

- Between Cape Kónsia and Cape Alonáki (Kardiki), 2½ miles north-westward, the coast is low, sandy and fringed by a shallow bank, about
45 a quarter of a mile wide on which there are rocks in places; within this stretch of coast is the shallow salt-water lake of Kórisa (Corissa).

- Vranganiótika (Bragonitica) reef, with a least depth of 2 fathoms (3^{m7}) over it, lies on the southern end of a shoal situated from three-quarters of a mile to 1½ miles south-westward of Cape Alonáki.
50 Between this reef and Cape Kónsia, eastward, there are two detached rocky patches, the outer with a depth of 2 fathoms (3^{m7}) over it, and the inner with a depth of 3 fathoms (5^{m5}) over it. A detached 2-fathom (3^{m7}) patch lies about half a mile west-north-westward of Cape Alonáki.

Charts 1800, 1440, 2158a, 2158b.



Cape Aspro, Corfu, bearing about 310° , distant 5 or 6 miles.
(Original dated 1822.)



Cape Aspro, Corfu, from the south-westward, distant 4 or 5 miles.
(Original dated 1822.)

Chart 206.

From Cape Alonáki, the coast trends about $4\frac{1}{2}$ miles north-north-westward to Cape Faskiá and is formed by the base of Mount Pavliána and Mount Garoúna which rise to elevations of over 1,500 feet (457^m2), less than half a mile inland. This portion of the coast is fringed by a coastal bank about half a mile wide on which there are above-water and sunken rocks. A 4-fathom (7^m3) patch, with a 5-fathom (9^m1) patch about a quarter of a mile north-north-westward of it, lies, detached, about $1\frac{1}{2}$ miles north-westward of Cape Alonáki and three-quarters of a mile offshore.

Pénde (Pendunisi), a group of islets with sunken rocks close to them, lies on the outer edge of the coastal bank, about $2\frac{1}{2}$ miles north-north-westward of Cape Alonáki (*Lat.* $39^\circ 27' N.$, *Long.* $19^\circ 53' E.$).

Tholétto, an islet with an above-water rock close off its south-western side, is situated close offshore about half a mile northward of Cape Faskiá; Nikólaos tou Mítika, a small roadstead visited by small vessels, with local knowledge, is situated on the eastern side of this islet.

Between the coast abreast Tholétto and Cape Áyios Yeóryios, about $5\frac{1}{2}$ miles north-north-westward, there is a bight with a sandy beach, about a mile long, near its southern end. Northward of the sandy beach the coast is slightly indented, and the land immediately inland is hilly with peaks from 785 to 893 (239^m3 to 272^m2) high; the shore of the bight is fringed by a rocky bank about 2 cables wide.

Pétres Nífis (Gordi), a group of above-water rocks, lies about $2\frac{1}{2}$ miles north-north-westward of Tholétto and 3 cables offshore; there is a depth of 5 fathoms (9^m1) eastward of these rocks and the depths outside them are considerable, at a distance of half a mile.

Mount Áyios Yeóryios, 1,288 feet (392^m6) high, stands about three-quarters of a mile eastward of the cape of the same name; it is the summit of a steep promontory, the coast of which is rugged, steep and rocky, and which, at a distance appears isolated.

Érmones bay, the entrance to which is about half a mile wide, lies close northward of Cape Áyios Yeóryios; a small stream flows through a fertile valley into the head of this bay.

Cape Pláka (Plakka), $1\frac{1}{2}$ miles north-westward of Cape Áyios Yeóryios, is high, slightly projecting and steep-to. Between Cape Pláka and Cape Áyios Iliodhóros, 2 miles north-north-westward, the coast is precipitous and is fringed in places with above-water and sunken rocks, the land within rising in high bold ridges.

Kolívri (Koliviri), an islet, which is steep-to, lies about a mile north-westward of Cape Pláka and half a mile offshore.

Liapádhēs bay, the north-western side of which is high and cliffy, is entered between Cape Áyios Iliodhóros and Cape Kostéri, about a mile north-north-westward; this bay affords shelter with northerly and easterly winds, and vessels occasionally anchor here in a depth of about 10 fathoms (18^m3), fine sand. A 2-fathom (3^m7) patch lies a quarter of a mile north-westward of Cape Áyios Iliodhóros on the eastern side of the entrance to the bay.

Chart 206, plan of Ports Alípa and St. Spiridione.

Alípa and Áyios Spiridhōn havens.—**Light.**—Between Cape Kostéri and Cape Falakrón (Palacrum), about 2 miles west-north-westward, the high, cliffy coast is indented by two havens which are open southward and are only suitable for small craft.

The entrance to Alípa haven, the eastern and larger, is about

Charts 203, 1800, 1440, 2158a, 2158b.

Chart 206, plan of Ports Alipa and St. Spiridione.

1½ cables wide between Cape Kostéri and the eastern side of a promontory which has a church on it. Within, there are three shallow, rocky coves, the northern and eastern of which have an above-water rock in the entrance lying about half a cable off its head. Just within the entrance to the haven, there is an area with depths of from 4 to 9 fathoms (7^m3 to 16^m5). The village of Lákonos (Lacones) is situated on a cliffy height above the head of the haven.

A light is exhibited, at an elevation of 82 feet (25^m0), from an iron structure on Cape Kostéri (Lat. 39° 40' N., Long. 19° 44' E.).

The entrance to Áyios Spiridhōn (St. Spiridione), the western haven, is about 1½ cables wide between the south-western extremity of the promontory, previously mentioned, and the southern extremity of Palaiokastritsa (Paleo Castrizza) peninsula; there is a shallow bank, about half a cable wide, at its head. Áyios Spiridhōn monastery and some other buildings stand on the peninsula.

Skialoudhi (Skialuthi), an islet, lies about 1½ cables off the south-western extremity of Palaiokastritsa peninsula and Orthólitho, an above-water rock, lies about half a mile west-north-westward of Skialoudhi and 1½ cables off a point on the coast northward. The Venetian fortress of Áyios Ángelos stands, in ruins, on a hill, 1,081 feet (329^m5) high, about 2 cables north-eastward of the last-mentioned point.

The depths are considerable at a distance of half a mile off this stretch of coast. During strong north-westerly winds, the squalls from the land are very heavy.

Chart 206.

North-western side of Corfu.—Light.—Cape Falakrón rises from the sea in bold precipitous cliffs, and is easily identified by Áyios Ángelos fortress.

Áyios Yeóryios (St. George's) bay is entered between a point about 1½ miles northward of Cape Falakrón and Cape Arílla, about a mile further north-westward. The south-eastern side of this bay is foul to the distance of a quarter of a mile offshore and, at its head there is a sandy beach. In the northern corner of the bay there is good summer anchorage in depths of from 6 to 8 fathoms (11^m0 to 14^m6), sand; but, being exposed to south-westerly winds, it is seldom resorted to.

Cape Arílla is bold, 298 feet (90^m8) high, and is the termination of a tongue of land projecting southward from the coast. Timóni roadstead, suitable only for boats, is situated in a cove on the western side of this projection, from 3 to 4 cables northward of Cape Arílla light-structure.

A light is exhibited, at an elevation of 95 feet (29^m0), from a white iron column, situated on the south-eastern extremity of Cape Arílla.

Between Timóni roadstead and Cape Kefáli (Kephali), 2 miles north-north-westward, there is a rocky bight, the coast of which is cliffy in the southern part for the distance of about three-quarters of a mile, and has a sandy beach, about 1½ miles long, in the northern part, fringed by a narrow, shallow bank. Graviá (Kravia), an islet, 218 feet (66^m4) high, with a sunken rock close off its southern end, lies about 1½ miles southward of Cape Kefáli and one mile offshore. The two Yinaíka islets lie close off the northern end of Graviá and are connected to the coastal bank, eastward, by a ridge with depths of 3 and 4 fathoms (5^m5 and 7^m3) over it. In case of necessity, with westerly winds, a vessel

Charts 1800, 1440, 2158a, 2158b.

Chart 206.

might anchor off the eastern side of Graviá, in depths of from 7 to 13 fathoms (12^m8 to 23^m8).

Cape Kefáli, the western extremity of Corfu, is a low tongue projecting westward, the land within rising in peaked hillocks. 5 Between this cape and Cape Dhrástis (Drasti), 3½ miles north-eastward, the coast, except close to Cape Kefáli, is composed of steep, chalky cliffs, and fringed by a bank, with depths of 5 fathoms (9^m1) and less over it, about three-quarters of a mile wide in places. A detached 2-fathom (3^m7) rocky shoal lies 3½ cables westward of Cape Kefáli; 10 a detached 5-fathom (9^m1) shoal lies about 1½ miles northward of the same cape; and a detached shoal, with depths of from 2 to 3 fathoms (3^m7 to 5^m5) over it, lies near the edge of the coastal bank, about 1½ miles south-westward of Cape Dhrástis (*Lat.* 39° 48' N., *Long.* 39° 41' E.). 15

Cape Dhrástis, the north-western extremity of Corfu, is a low, white, chalky, projection; a bank, with depths of 5 fathoms (9^m1) and less over it, extends about half a mile north-north-westward of the cape.

Off-lying islands.—The islands of Samothráki, Othonói, and Erikoúsa, together with several islets and dangers, lie on the bank, 20 with depths of less than 100 fathoms (182^m9) over it, which extends about 15 miles off the north-western end of Corfu. See view A on chart 206.

Dhiáplo (Diaplo), an islet, 152 feet (46^m3) high, cliffy and closely surrounded by sunken rocks, lies with its southern extremity about 25 1½ miles west-north-westward of Cape Kefáli. A rock, with a depth of one fathom (1^m8) over it, and steep-to, lies about half a mile eastward of the southern end of Dhiáplo.

Dhiákopo (Diakopo), an islet, 101 feet (30^m8) high and cliffy, lies close off the south-western side of Dhiáplo; there is a sunken rock about 30 half a cable off the western end of Dhiákopo (*Lat.* 39° 45' N., *Long.* 19° 36' E.).

Karávi, a rock, 98 feet (29^m9) high and steep-to, lies three-quarters of a mile west-south-westward of Dhiákopo. An above-water rock lies about 1½ cables south-eastward of Karávi, and Pláka, a rock, 4 feet 35 (1^m2) high and steep-to, about 6 cables further south-south-eastward.

The current amongst these islets and rocks, and between them and Corfu, is occasionally strong.

Samothráki, an island, 500 feet (152^m4) high, and fringed by a bank about half a mile wide, on which there are above-water and sunken 40 rocks, lies with its south-eastern extremity about 1½ miles westward of Karávi, with a one-fathom (1^m8) rocky patch nearly midway between.

A shallow spit extends about a mile south-south-westward of Cape Trafó, the south-western extremity of Samothráki; Platiá, an islet, with some sunken rocks close north-westward of it, lies at the outer end 45 of this spit. A detached shoal, with a least depth of 2 fathoms (3^m7) over it, lies from 3 to 6 cables south-eastward of Platiá.

Trakhía (Trachia), an islet, 92 feet (28^m0) high, lies about a mile south-westward of Cape Sakkí, the north-western extremity of Samothráki, and three-quarters of a mile off the western side of that 50 island, with a 5-fathom (9^m1) patch midway between. An above-water rock lies about 5 cables north-westward of Cape Sakkí, with a rocky 2-fathom (3^m7) patch about 1½ miles further west-north-westward.

Othonói (Fano), the largest of the islands off-lying the north-western

Charts 2701, 1800, 1440, 2158a, 2158b.

Chart 206.

side of Corfu, lies with Cape Avláki, its south-eastern extremity, about $5\frac{1}{2}$ miles north-westward of Cape Sakki. The south-western part of Othonoi is 1,339 feet (408^m1) high and its north-western end is 5 1,034 feet (315^m2) high, giving the island a forked appearance when viewed from westward. The island is covered with pine trees; its western side is precipitous and thence it slopes eastward. The island lies near the western edge of the bank, with less than 100 fathoms (182^m9) over it, extending north-westward of Corfu, mentioned previously. 10

There is a small bay on the south-western side of the island which affords shelter to small vessels, with local knowledge, from the strong north-westerly summer breezes. A breakwater extends about half a cable southward of Cape Avláki and forms the western side of a small 15 harbour for fishing boats.

Áspri Pétra (Osprey), a rock with a depth of one fathom (1^m8) over it, and which is steep-to, lies about half a mile south-westward of Cape Avláki.

Between Cape Avláki and Cape Kastri, the north-eastern extremity 20 of the island, there is a sandy bay, the shore of which is fringed by a bank on which there are above-water and sunken rocks; this bank is half a mile wide off Cape Avláki. A detached shoal, with a depth of 2 fathoms (3^m7) over it, lies about three-quarters of a mile north-eastward of Cape Avláki and a quarter of a mile offshore. Two danger- 25 ous rocky patches lie off Cape Kastri, one, with a depth of 2 fathoms (3^m7) over it, lies about half a mile south-south-eastward, and the other, with a depth of one fathom (1^m8) over its southern head, and depths of 6 or 7 fathoms (11^m0 or 12^m8) around it, lies three-quarters of a mile east-north-eastward of the cape.

30 Vessels, with local knowledge, can anchor in this bay.

Cape Kastri is 324 feet (98^m8) high and has on it the remains of a Venetian fort.

Erikoussa (Merlera), the northernmost of the islands north-westward of Corfu, lies with its south-western extremity about $6\frac{1}{2}$ miles east- 35 north-eastward of Cape Kastri; the passage between, with the exception of the shoals off the last-mentioned cape, being clear of dangers. The island is 435 feet (132^m6) high at its northern end; its northern and western sides are cliffy and fringed with rocks, the cliffs of the northern coast being white. On the southern side of the island there 40 is a sandy bay used by small craft, with local knowledge, but it is exposed to southerly winds which cause a heavy swell.

Light.—A light is exhibited, at an elevation of 288 feet (87^m8), from a white circular tower on a stone dwelling, situated about 4 cables westward of Cape Kastri (*Lat.* $39^\circ 51' N.$, *Long.* $19^\circ 26' E.$).

45 **Northern side of Corfu.—Off-lying dangers.**—The coast between Cape Dhrástis and Cape Ayia Aikaterini (St. Katerina), the northern extremity of Corfu, about 8 miles east-north-eastward, is generally low and sandy, fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, about half a mile wide, and on which there are sunken rocks lying 50 close offshore, in places; the coast is backed by cultivated plains.

Sidhári (Sidari) bay lies between Cape Apotripoti, about a mile eastward of Cape Dhrástis, and Cape Astrakári, about $2\frac{1}{2}$ miles further eastward; two islets lie close off the last-mentioned cape. Áyios Yeóryios (St. Giorgio) bay lies between Cape Ródha, $1\frac{1}{2}$ miles eastward

Charts 2701, 1800, 1440, 2158a, 2158b.

Chart 206.

of Cape Astrakári, and Cape Ayía Aikateríni. Both these bays afford anchorage, but as the telegraph cable from Otranto is landed in this vicinity, caution is necessary.

Cape Ayía Aikateríni is easily distinguished by the church on its summit, which is about 200 feet (61^m0) high.

Astrakári reef, with a least depth of one fathom (1^m8) over it, lies from three-quarters of a mile to 1½ miles northward of the cape of the same name; about 3 cables further north-westward, there is a shoal with a depth of 4 fathoms (7^m3) over it,

The northern extremity of Dhiáplo, bearing 244°, open north-westward of Cape Dhrástis, leads northward of these dangers; Shën Gjergj (St. Giorgio) monastery, on the mainland near the north-western corner of Liqen i Butrintit, bearing 097°, and open northward of Cape Ayía Aikateríni, also leads northward of the dangers.

CORFU STRAIT. — Southern part. — Lights.—Corfu strait separates the island of that name from the mainland eastward. It is entered from south-eastward between Cape Áspro and the north-western extremity of the island of Sívota, about 5 miles east-north-eastward. The bank, extending south-eastward from Cape Áspro, has been described on page 146. *See* view of Cape Áspro, bearing 310°, facing page 146.

On the south-western side of Corfu strait, Cape Levkímmi (Lefkimo), about 6½ miles north-north-westward of Cape Áspro, is a tongue of sand projecting north-north-eastward, from which a shallow bank extends about half a mile further northward; Cape Levkímmi is so low that it is difficult to identify it at a distance. The intervening coast is low and bordered by a bank, with depth of less than 5 fathoms (9^m1) over it, about half a mile wide, on which there are some sunken rocks in places. The south-western peak of Mount Pandokrátor in line with the centre of Vídhó island, bearing 324°, leads close north-eastward of the bank extending from Cape Levkímmi. For anchorage off this stretch of coast, *see* page 161.

A light is exhibited, at an elevation of 22 feet (6^m7), from a metal column on an iron hut, situated on Cape Levkímmi.

A light is occasionally exhibited, at an elevation of 16 feet (4^m9), from an iron column, situated on the centre of a pier on the southern side of a river about 1½ miles south-south-eastward of Cape Levkímmi (*Lat.* 39° 27' N., *Long.* 20° 06' E.).

Levkímmi bay is entered between the cape of the same name and Cape Voukári (Buccari), about 3½ miles westward; the latter is 274 feet (83^m5) high. The coast of this bay is low and fringed by a narrow, shallow bank. Levkímmi salt marshes are situated near the coast one mile south-westward of the cape of that name. For anchorage, *see* page 161.

On the eastern side of the southern part of Corfu strait, Cape Karaóuli is situated on the mainland about 2½ miles north-north-eastward of Sívota light-tower. Khíro (Hieronisi), an islet, 115 feet (35^m0) high, lies close north-westward of Cape Karaóuli.

Chart 206, with plan of Port Gomenizza.

Platariá bay, open westward, is entered between Khíro and Áyios Dhionísios (Aio nísi), an islet, 74 feet (22^m6) high, which lies close off the north-western extremity of Liotrivíá peninsula, which rises to an

Chart 206, with plan of Port Gomenizza.

elevation of 1,100 feet (335^m3). The coast on both sides of the bay is high and rocky, but its head is low with Platariá plain inland; the village of Platariá lies on the northern side of the head of the bay, whence a cultivated valley extends south-eastward between bold precipitous ridges. Two rocky patches lie near the centre of the bay, one, with a least depth of 5 fathoms (9^m1) over it, about a mile, and the other, with a least depth of 3 fathoms (5^m5) over it, about three-quarters of a mile from its head. This bay is seldom resorted to as an anchorage, and is subject to heavy squalls during southerly gales.

Between Áyios Dhionísios and Cape Vatátza (Livitazza), 164 feet (50^m0) high, the western extremity of Ligariá peninsula, about 3 miles north-westward, there is an indentation, at the head of which lies Igoumenítsa (Gomenizza) harbour, page 159. Prasoùdhi (Prasudi), an islet, 100 feet (30^m5) high and covered with vegetation, lies in the approach to the harbour, about three-quarters of a mile southward of Cape Vatátza. A sunken rock lies close off the south-western side of Prasoùdhi and, nearly midway between the islet and Ligariá peninsula, east-north-eastward, there is a reef on which there is an above-water rock.

Ligariá peninsula is 285 feet (87^m0) high and is connected to the mainland by a low, sandy isthmus, from which the coast, continuing low and sandy, trends about 1½ miles eastward and south-eastward, forming a bay and terminating in Cape Dhrépanon (Drepano), a projecting tongue. A shallow bank, which in one place is as much as a quarter of a mile wide, fringes the shores of this bay.

A light is exhibited, at an elevation of 45 feet (13^m7), from a white iron column on a concrete base on Cape Kodramoúrto, situated about half a mile south-south-eastward of Cape Dhrépanon (*Lat.* 39° 30' N., *Long.* 20° 15' E.).

Chart 206.

Váltos (Livitazza) bay, page 160, open westward, is entered between Cape Vatátza and the southern mouth of the Thíamis (Kalamo) river, about three-quarters of a mile west-north-westward.

On the western side of the southern part of Corfu strait, from Cape Voukári, the coast trends 3 miles west-north-westward to the village of Mesongí (Mirangi) and is low, but the land within rises to an elevation of 1,043 feet (317^m9), at a distance of about half a mile; thence the coast trends about 9 miles north-north-westward and northward to Cape Sidhero. From abreast Mesongí, the land rises in thickly wooded ridges towards the sharp peaks of Mount Stavrós, 1,476 feet (450^m0) high, about 3½ miles north-north-westward, and Mount Áyioi Dhéka, about 1½ miles further north-westward, the summit of the southern part of the island of Corfu.

Mesongí stands on the beach southward of the mouth of a rivulet. The village of Benítsa (Benizza) lies about 4 miles north-north-westward of Mesongí under the mountains just mentioned. The land, for a considerable distance northward of this village, is undulating and thickly wooded.

For anchorage off these villages, see page 161.

Chart 1450.

Pondikó (Ulysses), an islet, 64 feet (19^m5) high, with a chapel on it, lies about 2½ miles northward of Benítsa and a cable off the coast, to which it is connected by a reef on which some of the rocks are awash.

Charts 1800, 1440, 2158b.

Chart 1450.

The islet lies on the southern side of the entrance to Khalkiopoulos (Kalikiopulo) lagoon which is about $2\frac{1}{2}$ cables wide; a causeway has been built across the entrance.

Garitsa (Kastrades) bay is entered between a point about $1\frac{1}{2}$ miles north-north-eastward of Pondikó and Cape Sídhero (Sidhero), about three-quarters of a mile further north-north-eastward. A detached $6\frac{1}{2}$ -fathom (11^m9) patch lies about 7 cables south-south-eastward of the southern entrance point of Garitsa bay, and 4 cables offshore. A pier projects a short distance northward from the southern entrance point of Garitsa bay. This bay is shallow and only used by fishing boats. Garitsa, a suburb of the town of Corfu, lies at the head of the bay.

Anchorage is prohibited north-eastward of a limit indicated on the chart by a pecked line.

Cape Sídhero is the eastern extremity of a rocky promontory on which the Citadel of the town of Corfu stands.

The promontory is separated from the town, westward, by a moat, in which there are depths of about 7 feet (2^m1). The Citadel is built on a rugged precipitous rock with two peaks, each crowned by a battery; on the western peak are the light-tower, and signal station.

A light is exhibited, at an elevation of 253 feet (77^m1) from an iron tower on a masonry base, 13 feet (4^m0) in height, in the Citadel (Lat. $39^{\circ} 37' N.$, Long. $19^{\circ} 57' E.$). See view.

Chart 206.

On the eastern side of Corfu strait, the Thíamis river flows out by two mouths, the northern being about $3\frac{1}{2}$ miles northward of the southern mouth, situated on the northern side of Váltos bay. The coast between these two mouths is low but rises inland to Mount Mávro (Mavronoros), which has two peaks, the northern being 1,675 feet (510^m5) high.

Vankhís (Bacchante) flats, formed by the alluvium from the Thíamis river, and with depths of less than 6 fathoms (11^m0) over them, extend off this stretch of coast and are as much as $2\frac{1}{2}$ miles wide off the northern mouth. These flats are a continuation southward of the shallow bank bordering the south-eastern side of Sayiádha (Saiada) bay, and are steep-to.

Móurtos village in line with the western extremity of Prasóúdi, bearing 146° , leads south-westward of Vankhís flats.

Sayiádha bay, page 160, open westward, is entered between a point about half a mile north-north-westward of the northern mouth of the Thíamis river and Strovíli, a remarkable, conical hill, 377 feet (114^m9) high, on a small peninsula, about 3 miles further north-north-westward.

The south-eastern extremity of Paganía peninsula, 270 feet (82^m3) high, lies about $1\frac{1}{2}$ miles west-north-westward of Strovíli hill; Khilkiás bay, the entrance to which is three-quarters of a mile wide, is situated eastward of this peninsula. This bay is open southward and two islets lie close offshore on its western side.

Chart 206, plan of Port Paganía.

Paganía harbour lies on the northern side of the peninsula of that



*Citadel light-tower,
Corfu.*

Charts 206, 1800, 1440, 2158a, 2158b.

Chart 206, plan of Port Pagania.

name. The entrance, open westward, is about 3 cables wide between Cape Paganiá, the north-western extremity of the peninsula, and the mainland northward. The inner part of the harbour is landlocked and
 5 a cable wide, narrowing towards its head. An islet, on which there is a ruin, lies on the eastern side close offshore, about $3\frac{1}{2}$ cables from the head of the inner part of the harbour. For anchorage, *see* page 161.
Chart 206.

A Customs house is situated on the shore of a small bay about
 10 $1\frac{1}{2}$ miles west-north-westward of Cape Paganiá (*Lat.* $39^{\circ} 40' N.$, *Long.* $20^{\circ} 06' E.$).

Danger.—A rock, with a depth of 3 fathoms (5^{m5}) over it, and steep-to, lies about $1\frac{1}{2}$ miles west-north-westward of Cape Paganiá and 7 cables offshore.

15 Strovíli hill in line with the southern extremity of Paganiá peninsula, bearing 109° , leads south-westward of this rock.

Coast.—Fteliá harbour, open southward, is entered between a point about $3\frac{1}{2}$ miles west-north-westward of Cape Paganiá and a point about half a mile further west-south-westward. An islet lies close off its
 20 western side, a short distance within the entrance, and there is a creek on its eastern side.

For anchorage, *see* page 161.

Cape Stilo lies about a mile west-north-westward of the western entrance point of Fteliá harbour; the cape is low and salient, but the
 25 land, about $1\frac{1}{2}$ miles within it, rises to an elevation of 883 feet (269^{m1}). Stilo islet, 270 feet (82^{m3}) high, lies half a mile south-eastward of the cape and about a cable offshore, with a depth of 4 fathoms (7^{m3}) in the passage between.

Chart 1450.

30 **Northern part of Corfu strait.**—On the western side of Corfu strait, Cape Áyios Nikólaos lies about 4 cables north-westward of Cape Síðhero. Corfu harbour, page 158, with the suburb of Mandoúki at its head, lies between Cape Áyios Nikólaos and Cape Kefalomándoukon, about $1\frac{1}{2}$ miles west-north-westward. Between the latter cape and the
 35 south-eastern entrance point of Gouvía harbour, about $2\frac{1}{2}$ miles north-westward, there are two bights, divided from one another by some low land through which a river flows into the sea, about 6 cables westward of Cape Kefalomándoukon. The shore along this stretch of coast is fringed by a narrow, shallow bank.

40 **Off-lying islets.—Dangers.—Light.**—Vídho (Vido), an island, 142 feet (43^{m3}) high, lies with its south-eastern extremity about $6\frac{1}{2}$ cables northward of Cape Áyios Nikólaos. The island is fringed by a narrow, shallow bank on portions of its south-western side; a shallow, rocky bank extends from its north-western side, which, in one place, is
 45 about $1\frac{1}{2}$ cables wide. Kóndilo (Kondalonisi), a group of above-water rocks, lies near the outer edge of this bank, about $1\frac{1}{2}$ cables north-westward of the northern extremity of Vídho. There is a landing place with a small pier on the south-western side of the island. A conspicuous white stone monument, surmounted by a cross, stands on
 50 the south-eastern end of Vídho.

Kalóyiros (Calovero), a rock, 30 feet (9^{m1}) high, and surrounded by a narrow, shallow bank, lies 4 cables north-westward of the south-western extremity of Vídho, connected to that island by a bank over which the depths are uneven and, in some places, less than 5 fathoms

Charts 206, 1800, 1440, 2158b.

Chart 1450.

(9^m1). A detached shoal, with a depth of 4½ fathoms (8^m7) over it, lies 3 cables north-eastward of Kalóyiros, and another, with a least depth of 5½ fathoms (9^m6) over it, lies from 1½ to 4 cables west-north-westward of the same islet.

Only vessels of shallow draft should use the passage between Kalóyiros and Vídhō.

Gouvínōn (Lazaretto), an islet, 68 feet (20^m7) high, lies in the approach to Gouvía harbour, about 1½ miles west-north-westward of Kalóyiros and 7 cables offshore.

A light is exhibited, at an elevation of 39 feet (11^m9), from a white obelisk, 23 feet (7^m0) in height, on the south-eastern extremity of Vídhō (Lat. 39° 38' N., Long. 19° 57' E.).

A light is occasionally exhibited from the landing place on Vídhō.

Coast.—The south-eastern entrance point of Gouvía (Govino) harbour is the northern end of a tongue of land projecting northward; the north-western entrance point lies about 2½ cables further north-westward and is the southern end of a promontory projecting southward; this harbour is well sheltered. A shallow bank, about 2 cables wide, extends northward and north-westward from the south-eastern entrance point, and a similar bank, about half a cable wide, extends from the north-western entrance point, leaving a very narrow channel, in the fairway of which the least depth is about 4 fathoms (7^m3). Within, extensive mudbanks fringe both sides of the harbour, leaving a small area in which the depths are from 3 to 4½ fathoms (5^m5 to 7^m8). The sides consist mostly of marshes and the harbour is seldom used.

Koméni Kefalí (Comeni head), a small promontory, 130 feet (39^m6) high, with an islet and an above-water rock lying close off its south-eastern extremity, lies about 6 cables north-eastward of the north-western entrance point of Gouvía harbour.

Chart 206.

Krevátsoula bay is entered between Koméni Kefalí and Cape Kefalóipsos (Kephalo Ypsō), about 1½ miles north-north-westward. A spit extends about one cable south-eastward of Cape Kefalóipsos, with a depth of 5 fathoms (9^m1) outside it. A bank, with depths of less than 5 fathoms (9^m1) over it, which is as much as 4 cables wide at its head, fringes the shore of Krevátsoula bay. There are a church and a villa on the south-western side of the bay.

Ípsō (Ypsō) bay lies between Cape Kefalóipsos and a point, about 1½ miles north-north-eastward. The shores of this bay are fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, which is as much as 4 cables wide in places. A conspicuous red house stands 3 cables north-westward of Cape Kefalóipsos. For anchorage, see page 161.

From the northern entrance point of Ípsō bay, the coast trends about 3½ miles east-north-eastward, along the base of Mount Pandokrátōr, to Cape Agnī (Lat. 39° 44' N., Long. 19° 57' E.), and is bold and steep-to. There are two small bays, of which Kalámi bay is the northern, between Cape Agnī and a point, about three-quarters of a mile north-eastward; the village of Koulóúra stands on this point.

On the eastern side of Corfu strait, Gji i Butrintit is entered between a point about 2 miles northward of Cape Stilo and a point about half a mile southward of Kep i Skalēs (Scala); the latter lies about 3½ miles northward of Cape Stilo. This bay is considered to afford the best

Charts 2701, 1800, 1440, 2158a, 2158b.

Chart 206.

anchorage off the eastern side of Corfu strait, but caution should be used in its approach, as the depths decrease suddenly from depths of 12 fathoms (21^m9). The mouth of Butrint river lies in the north-eastern part of the bay, and that of the River Pavlë (Katito), in the south-eastern part. Between these two mouths, a mudbank, parts of which dry, extends a considerable distance offshore; this mudbank is formed by deposit from the latter river. For anchorage, *see* page 161.

10 Ligen i Almurës lies northward of Butrint river, separated from the northern shore of the bay of that name by a narrow strip of low land. Ligen i Butrintit lies north-eastward of the bay and is separated from the sea by a strip of land which is narrow at its northern end. This lake, at its south-western end, flows into the river of the same name.

15 An abundance of game is found in the neighbourhood. Ligen i Butrintit, the River Pavlë, and Váltos bay are the best grounds for snipe, woodcock, and wildfowl of all kinds; the vicinity of Fteliá and Paganiá harbours, for deer and wild boar.

On the western side of the strait, Cape Áyios Stéfanos lies about 20 $1\frac{1}{2}$ miles north-north-eastward of the point on which the village of Kouoúra stands, and the north-eastern extremity of Corfu. (*Lat.* 39° 46' N., *Long.* 19° 58' E.) lies about three-quarters of a mile further north-north-eastward.

Karagiól bay, which is open south-eastward, is entered between 25 a point about 3 cables northward of the village of Kaloúra and a point about three-quarters of a mile south-south-westward of Cape Áyios Stéfanos.

Áyios Stéfanos bay, which is small and open southward and south-eastward, lies close south-westward of the cape of that name. There 30 are some buildings and two small piers at the head of this bay, and a mill stands on the slope of a hill about 3 cables northward of the piers. This bay is only suitable for small vessels with local knowledge.

Danger.—Beacon.—Sérpa rocks, one of which is above-water, lie on a reef which extends about a quarter of a mile east-north-eastward 35 from a point situated about 2 cables northward of Cape Áyios Stéfanos. These rocks are steep-to on their eastern side; the width of the strait between them and the mainland, east-south-eastward, is about one mile. In calm weather, they are visible on account of the reddish colour of the water in their vicinity.

40 A white cylindrical beacon, about 8 feet (2^m4) in height, marks the above-water rock. A vessel should not pass within a distance of one cable, eastward of the beacon.

Strait.—On the eastern side of Corfu strait, between Kep i Skalës and a point about $1\frac{1}{2}$ miles north-north-eastward, the land rises to an elevation of 496 feet (151^m2) a short distance inland, and, with the 45 opposite coast of the island of Corfu, forms the narrowest part of the strait. A bay is entered between the last-mentioned point and a point about $1\frac{1}{2}$ miles further north-north-eastward. Tetranisi, a group of four islets, lie in the southern part of this bay. For anchorage, *see* 50 page 161.

From the northern entrance point of this bay, the coast trends $1\frac{1}{2}$ miles north-north-eastward, where Shën Gjergj monastery stands on a hill, 354 feet (107^m9) high, midway between the coast and the north-western corner of Ligen i Butrintit. Thence the coast trends $1\frac{1}{2}$ miles

Charts 2701, 1440, 2158a, 2158b.

Chart 206.

northward to Dentë point (*Lat. 39° 50' N., Long. 20° 01' E.*). This portion of the coast is generally high and rocky.

On the south-western side of this part of Corfu strait, a detached one-fathom (1^m8) patch lies about 1½ cables northward of the north-eastern extremity of Corfu and three-quarters of a cable offshore. Cape Psaromíta lies about three-quarters of a mile north-westward of the same extremity, and Cape Varváro (Barbara), the north-western extremity of a promontory, lies about 4 cables further north-westward.

Bolána bay, open northward, is entered between Cape Varváro and Cape Atolikós, about half a mile westward; this bay affords shelter from southerly winds, but is seldom used. Some above-water rocks lie close off Cape Varváro and a shallow bank extends about a cable from its north-western side. A detached bank, with a depth of 7 fathoms (12^m8) over it, lies from 3 to 4 cables north-north-westward of this cape.

Cape Kassiópis (Cassopo), on which are the ruins of a Venetian fort, lies about half a mile north-westward of Cape Atolikós; a sunken rock lies close offshore a short distance south-eastward of Cape Kassiópis.

Áspro (Aprau) bay is entered between Cape Kassiópis and Cape Áyios Spirídhon (Spiridione), about 2 miles west-north-westward. Ímeroliá (Cassopetto) bay, which is small, is situated on the south-western side of Cape Kassiópis. These places are seldom resorted to.

Between Cape Áyios Spirídhon and Cape Áyia Aikateríni, about 1½ miles west-north-westward, the coast is fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, which is about half a mile wide.

Off-lying islet and dangers.—Light.—Peristeráí (Tignoso), an islet, lies about three-quarters of a mile east-north-eastward of Cape Varváro; the islet looks like a number of whitish stones irregularly placed one upon the other and is crowned by a white circular lighthouse and a few small trees. Depths of less than 5 fathoms (9^m1) extend about a cable north-westward, and about 1½ cables south-eastward of the islet. The landing place is at the southern end.

An above-water rock, nearly awash, lies about 2 cables northward of Peristeráí with depths of about 8 fathoms (14^m6) midway between.

Barkétta (Barchetta), a rock only a few feet above water, and so named from its resemblance to a boat bottom upwards, lies about half a mile eastward of Peristeráí; a bank, with depths of less than 5 fathoms (9^m1) over it, extends 1½ cables northward and southward of Barkétta, on the northern extremity of this bank there is a 2-fathom patch. Eastward of Barkétta and westward of Peristeráí the channels are clear of dangers.

A light is exhibited, at an elevation of 98 feet (29^m9), from a white circular tower and dwelling, 55 feet (16^m7) in height, on Peristeráí. See sketch on chart 206.

Strait.—Danger.—On the north-eastern side of this part of Corfu strait, Gji i Sarandës, page 160, is entered between Dentë point and Ferruç, a point, about 2 miles north-north-westward; the town of Sarandë (Porto Edda) is situated at the northern end of the bay. The village of Lëkurës (Lykursi), which is conspicuous, lies about 1½ miles north-eastward of Dentë point and half a mile inland; a short distance northward of this village, there is a fort of the same name on a conical hill, 853 feet (260^m0) high.

Ferruç is bordered by a shallow bank, about 1½ cables wide; a shoal,

Charts 2701, 1440, 2158a, 2158b.

Chart 206.

with a least depth of 6 feet (1^m8) over its eastern end, and steep-to on its southern side, lies a quarter of a mile southward of this point, the passage between being only suitable for small craft, with local know-
5 ledge.

Between Ferruç and Cape Kefali (Kiephali), 4½ miles north-westward, the depths are considerable at the distance of half a mile offshore. Cape Kefali is 489 feet (149^m0) high, covered with stunted trees and bushes and is steep-to; a 7-fathom (12^m8) patch lies about 3 miles
10 south-eastward of the cape and 3½ cables offshore.

Corfu strait is entered from north-westward between Cape Kefali and Cape Ayía Aikateríni.

Charts 434, 1450.

Corfu harbour.—Anchorage.—The roadstead northward of the
15 town of Corfu is sheltered by the island of Vidho from the strong north-easterly winds which blow during the winter months; it affords anchorage in depths of from 10 to 16 fathoms (18^m3 to 29^m3), stiff mud and clay.

The best berth for men-of-war is in about mid-channel; to obtain
20 better protection Kep i Skalës should not be visible in this berth. Small vessels moor off the camber under the citadel. In 1938, the holding ground was reported to be bad in a position about 3½ cables north-eastward of Cape Kefalomándoukon.

Merchant vessels anchor off the health office and customs house, in
25 depths of from 5 to 10 fathoms (9^m1 to 18^m3), but vessels in quarantine are sent to lie off Gouvínou islet, where they remain until they receive pratique.

The roadstead is exposed to north-westerly winds, prevalent in June, July, and August, and to south-easterly winds, prevalent in December.
30 During the winter months northerly winds sometimes hamper and even, at times, suspend all working of cargo. See view B on chart 206.

For a distance of about a mile westward of Cape Áyios Nikólaos, a number of piers, with quays between them, project a short distance offshore; from close north-westward of Point Perpetua, situated half
35 a mile westward of Cape Áyios Nikólaos, a detached breakwater extends westward for about 1½ cables.

A breakwater, extending eastward from Cape Kefalomándoukon, indicated on the chart by pecked lines, has been proposed, but work had not been commenced on it in 1932. A conspicuous chimney stands
40 near Cape Kefalomándoukon. East-south-eastward of this chimney, at distances of 4 and 7½ cables, respectively, there are two other conspicuous chimneys.

On the southern side of the bay between Capes Áyios Nikólaos and Sidhero, there is a camber in which small vessels can lie in a depth of
45 6 feet (1^m8).

Lights.—A light is exhibited, at an elevation of 29 feet (8^m8), from a red iron column, 23 feet (7^m0) in height, from the quay, about 2½ cables westward of Cape Áyios Nikólaos (*Lat.* 39° 37' N., *Long.* 19° 55' E.).

50 A light is exhibited, at an elevation of 20 feet (6^m1), from a concrete column on the western end of the detached breakwater.

Pilotage.—Pilotage is compulsory for foreign merchant vessels.

Signal station.—There is a signal station at the citadel.

Quarantine.—The quarantine establishment is on Gouvínou islet.

Charts 2701, 1440, 2158a, 2158b.

Charts 434, 1450.

Vessels in quarantine anchor, in a depth of 13 fathoms (23^m8), about 3 cables southward of the islet.

Corfu town.—The town of Corfu, called Kérkira by the Greeks, is almost surrounded by fortifications. There are several churches, 5 hotels and a theatre. The health office and customs house are on the northern side of the town. The church, situated about 2 cables west-south-westward of Cape Áyios Nikólaos, has a white tower with a red roof, but it is not conspicuous from the anchorage. About 70 yards (64^m0) eastward of this church there is a white tower 10 with a large red dome and gallery.

There are cultivated plains and many villages, which stand on steep, well-wooded ridges, south-westward of the town.

The population, including that of the suburbs of Mandoúki and Garitsa, was 32,221, in 1937. 15

A British Consular Officer resides in the town.

Communications.—There is steamer communication with other Greek ports, and with Brindisi.

There is a radio station, *see* page 46.

Port facilities.—There is a crane, at the customs house quay, 20 capable of lifting weights up to 4 tons, and two smaller 2-ton cranes.

A small quantity of coal is kept in stock. Water can be supplied in two 10-ton tank boats.

Lighters are available.

Small repairs to vessels can be executed. 25

There is a civil hospital, with accommodation for about 40; also three well equipped nursing homes.

Provisions can be obtained.

Directions.—*See* pages 161 to 163.

Magnetic observation spot.—*See* Appendix III, page 607. 30

Chart 206, plan of Port Gomenizza.

Igoumenítsa harbour.—The entrance to this harbour lies between Áyios Dhionísios and Cape Dhrépanon, page 152. Shoals extend from both sides, forming a bar; it was reported, in 1945, that a vessel drawing 16 feet (4^m9) could cross this bar through a very narrow 35 channel about 4 cables long. Cape Kodramoúrto (Kudromurto) lies on the southern side, about half a mile south-south-eastward of Cape Dhrépanon. A bank, with depths of less than 3 fathoms (5^m5) over it, extends three-quarters of a mile from the north-western side of the harbour, and depths of less than 5 fathoms (9^m1) extend three-quarters 40 of a mile east-south-eastward of Cape Dhrépanon; the eastern side of the harbour is fringed by a narrow, shallow bank.

The town of Igoumenítsa, with a ruined fort at its southern end, lies on the eastern shore of the harbour. A small stone pier, with a depth of 9 feet (2^m7) alongside its outer end, extends in a south-westerly direc- 45 tion abreast the fort. The village of Vounospiliá (Grava) is situated about 3 cables north-eastward of the pier.

Light.—Light-buoy.—The light on Cape Kodramoúrto (*Lat.* 39° 30' N., *Long.* 20° 15' E.) is described on page 152.

A light-buoy, exhibiting a *red flashing* light every 1½ seconds, is 50 moored about 4 cables south-westward of Cape Dhrépanon and marks the north-eastern side of the narrow channel leading into the harbour.

Directions.—After passing southward of Prasoúthi, a vessel crossing the bar, should bring the isolated peak Oxía Korifi (Pinnacle peak),

Chart 206, plan of Port Gomenizza.

1,871 feet (570^m3) high, situated about 4 miles east-south-eastward of Cape Kodramourto, to bear 101°, and just open northward of that cape, and steer in on that course over the bar; then she should keep close to the southern shore by Cape Kodramourto and the point, about 4 cables east-south-eastward of it, and anchor off the Customs house, in a depth of from 9 to 14 fathoms (16^m5 to 25^m6), mud.

Chart 206.

Váltoš bay.—Anchorage.—The entrance to this bay, page 152, is somewhat deceptive, and the bay appears larger than it really is, the northern side being low and forming an extensive bight, but the available anchorage space is narrowed by the shallow bank extending from that side; the bank is about 1½ cables wide off the mouth of the river and extends about 6 cables from the head of the bight.

A shallow bank extends about a cable northward of Cape Vatátša, eastward of which the southern side of the bay is indented by three small bays.

Liyiá bay, which is shallow and, at the head of which, there is a fishery, is entered at the eastern end of Váltoš bay, between the eastern end of Ligariá peninsula and the foot of Astravétsi, a wooded hill, 463 feet (141^m1) high, about 1½ miles northward. A hill, 269 feet (82^m0) high, with a tower on it, stands three-quarters of a mile north-eastward of Astravétsi, and there is a wooded hill, the southern end of which is 167 feet (50^m9) high, standing a short distance inland from the head of Liyiá bay. These hills rise from a swamp.

There is anchorage in Váltoš bay in depths of from 9 to 11 fathoms (16^m5 to 20^m1), good holding ground. The best anchorage is in the middle one of the three bays on the southern side, which is almost land-locked, in a depth of 9 fathoms (16^m5), mud.

A vessel should enter Váltoš bay with great care, the channel between the shoal extending from Cape Vatátša and the bank extending from the northern side being less than 2 cables wide. After passing the shoal extending from Cape Vatátša, the channel is close to the southern side.

Sayiádha bay.—Lights.—A bank, which dries, extends about three-quarters of a mile off the southern entrance point of Sayiádha bay, page 153; and the south-eastern side of the bay, which is low, is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 1½ miles wide. The northern side of the bay is high, and bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 2 cables wide. A pier, with a depth of about 6 feet (1^m8) at its head, extends from a customs house at the head of the bay.

A light is exhibited, at an elevation of 23 feet (7^m0), from a white iron column on a concrete base, at Sayiádha.

A light is exhibited from the pierhead (*Lat.* 39° 37' N., *Long.* 20° 12' E.).

The small town of Sayiádha lies at the foot of the hills about a mile north-eastward of the pier.

A vessel entering should keep near the northern shore and anchor as convenient with the Customs house bearing 089°, in depths of from 4 to 12 fathoms (7^m3 to 21^m9), mud.

Gji i Sarandës.—Anchorages.—Gji i Sarandës, called Baia di Porto Edda by the Italians, page 157, is sheltered from all but westerly winds. Large vessels anchor near the middle of this bay, in depths of from 15 to 17 fathoms (27^m4 to 31^m1), mud and sand, and good holding ground.

Charts 206, 1800, 1440, 2158b.

Chart 206.

Small craft find shelter in the northern part of the bay abreast Fort Lëkurës.

The summit of Mount Pandokrátor, in Corfu, when covered with cloud, denotes bad weather with a prevalence of rain. 5

Southerly winds and squalls rise unexpectedly and are sometimes violent; they are predicted by a northerly or southerly swell.

Sarandë is in regular steamer communication with other ports in the Adriatic. The population, in 1940, was about 2,000.

A telegraph cable is landed in the north-eastern corner of the bay. 10

Anchorage in Corfu strait.—Off the western side of Corfu strait from a position about 2 miles northward of Cape Áspro, as far as Cape Levkímmi, page 151, there is anchorage, with westerly winds, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), sand.

Excellent anchorage will be found in Levkímmi bay, page 151, in 15 depths of from 15 to 17 fathoms (27^m4 to 31^m1). In 1907, H.M.S. *Queen* anchored in a good berth with Sívota light-tower in line with a storehouse at the salt marshes, bearing 109°, and Cape Levkímmi light-structure bearing 081°. There is also anchorage under Cape Voukári in a depth of 10 fathoms (18^m3), sand. When approaching 20 these anchorages, caution is necessary in rounding the bank extending from Cape Levkímmi (*Lat.* 39° 27' N., *Long.* 20° 06' E.).

Vessels occasionally anchor off the village of Mesongí, page 152, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), sand.

Vessels occasionally anchor off the village of Benítsa, page 152, in 25 a depth of 9 fathoms (16^m5).

Chart 206, plan of Port Paganía.

On the eastern side of Corfu strait, Paganía harbour, page 153, is but little frequented. A vessel anchoring here should run hawsers to the shore, as the bottom, although mud, is not good holding ground. 30

Chart 206.

Small craft, with local knowledge, occasionally seek shelter in Fteliá harbour, page 154, and either anchor northward of the islet off its western side, in depths of from 3 to 7 fathoms (5^m5 to 12^m8), or in the creek at its eastern end, in a depth of 9 or 10 fathoms (16^m5 or 18^m3). 35

On the western side of the strait, vessels occasionally anchor in Ípso bay, page 155, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), mud. In 1929, H.M.S. *Sandhurst* anchored in a depth of 18 fathoms (32^m9), with Cape Kefalóipsos bearing 260°, distant 8 cables; the bottom, though mud, was bad holding ground. 40

On the eastern side of the strait, in Gji i Butrintit, page 155, a berth can be obtained in a depth of 17 fathoms (31^m1), mud, at the southern end of the bay, about 3 cables offshore. Approaching from northward, the north-eastern extremity of Corfu should be kept open westward of the land in the vicinity of Kep i Skalës to avoid the mudbanks off the 45 mouth of Butrint river. The bar of this river can only be crossed by boats.

Vessels, with local knowledge, occasionally anchor off the southern side of Tetranisi, page 156, in a depth of 9 or 10 fathoms (16^m5 or 18^m3), sand; the shelter is very good in easterly or southerly winds, but the 50 depths are irregular.

Directions for Corfu strait.—To a steam vessel, the navigation of Corfu strait presents no difficulties as there are sufficient depths for all classes of vessels.

Charts 2701, 1800, 1440, 2158b.

Chart 206.

Approaching the southern end from westward, the passage between Paxoi and Cape Áspro is contracted to a width of about $5\frac{1}{2}$ miles by the bank extending southward of the latter. A vessel approaching from this direction should give Cape Áspro a berth of at least 3 miles. See view C on chart 206.

The coast of the mainland, as far northward as Prasoudhi, is clear and bold; Cape Levkimmi should be given a berth, of about one mile, and, when northward of Prasoudhi, the village of Mourtos should be kept open westward of that islet to avoid Vankhis flats, which are steep-to. When Corfu citadel light-tower (*Lat. $39^{\circ} 37' N.$, Long. $19^{\circ} 57' E.$*) is seen, a vessel may alter course as convenient, if proceeding to Corfu harbour.

A vessel approaching from south-eastward may pass on either side of Panayia reef; preference should, however, be given to the passage eastward of this reef, and, in a sailing vessel, the mainland should be kept aboard, particularly towards sunset, as at night the wind is almost certain to be off the land; the current also sets northward along this coast.

At night, a vessel approaching the southern end of the strait from north-westward or westward, should keep the light on the northern end of Paxoi bearing less than 125° , until Sívota light is in sight, when, if coming from north-westward, course may be altered eastward until Panayia islet light is seen. Paxoi may be rounded at the distance of about 2 to 3 miles, and when Sívota light bears 016° or less, it may be steered for, passing eastward of the bank extending southward from Cape Áspro. When about 2 miles from Sívota, a vessel should steer to pass it at a distance of from one to 2 miles; thence shape a course for the light on the citadel at Corfu, if proceeding to that harbour.

From south-eastward, it is advisable, especially for a sailing vessel, to pass eastward of Panayia reef and keep in mid-channel or well over towards the mainland. In proceeding northward, when near the bank off Cape Áspro, Panayia islet light should not be brought to bear less than 179° , and a vessel should steer towards Sívota light and proceed as before directed.

A vessel proceeding westward of Panayia reef should keep in the *white* sector of Panayia islet light, with that light bearing more than 277° , until, having passed through the *red* sector of Cape Ovoroú light, between bearings of from 167° to 185° , that light shows *white*, bearing less than 167° ; she should then pass through the *green* sector of Panayia islet light, between bearings of from 256° to 277° , until she has proceeded into the *white* sector of Panayia islet light, with that light bearing less than 256° , when she may steer towards Sívota island light, bearing less than 016° , and proceed as before directed.

Proceeding northward through the strait, a vessel should pass eastward of the beacon marking Sérpa rocks at a distance of not less than a quarter of a mile and thence pass westward of Peristerai at a distance of about $1\frac{1}{2}$ or 2 cables. See sketch of Peristerai and view B on chart 206.

A vessel passing eastward of Peristerai should do so midway between the mainland and Barkétta rock; when the southern end of Erikoúsa opens northward of Cape Ayia Aikaterini, a vessel is northward Barkétta rock.

With variable or contrary winds, it is advisable for a sailing vessel to

Charts 1800, 1440, 2158a, 2158b.

Chart 206.

keep the mainland aboard when passing through the narrow part of the strait.

At night, from a position westward of Cape Stilo, a vessel should bring the Citadel light to bear 192° and keep it on that bearing, astern, passing eastward of Sérpa rocks. If passing westward of Peristeraí, a vessel should steer for that light when it bears 340° and alter course as necessary to pass it at a distance of $1\frac{1}{2}$ or 2 cables; if passing eastward of Peristeraí, a vessel should stand on with the Citadel light bearing 192° , astern, until Peristeraí light bears 250° distant about one mile, when course may be altered north-westward.

A sailing vessel approaching the northern entrance of Corfu strait from north-westward or from the Adriatic, with northerly or westerly winds, should make for Othonoi and leave both it and Erikoúsa on the starboard hand. A sailing vessel arriving from westward, with a commanding breeze, may pass southward of Othonoi and Erikoúsa, giving the former a fair berth, but passing nearer to it than to Samothráki; from one mile southward of Erikoúsa, a vessel should steer for a position about one mile northward of Cape Ayía Aikateríni (*Lat.* $39^{\circ} 49' N.$, *Long.* $19^{\circ} 52' E.$).

Winds.—Northerly and north-westerly winds sometimes blow with violence in winter, for a short time. In summer, the breezes are generally light.

Currents.—The currents are fairly strong in the narrows between Kepi Skalès (*Lat.* $39^{\circ} 45' N.$, *Long.* $19^{\circ} 59' E.$) and Cape Áyios Stéfanos; their general direction is northerly, but there is ordinarily a surface current depending on the force and direction of the wind; in strong winds this attains a rate of from $1\frac{1}{2}$ to 2 knots.

Charts 2701, 1800, 1440, 2158a, 2158b.

CHAPTER IV

EASTERN COAST OF ADRIATIC FROM CAPE KEFALI TO BOKA KOTORSKA.

Chart 2701.

COAST.—Danger.—Between Cape Kefali (*Lat.* 39° 54' N., *Long.* 19° 56' E.) and Kep i Palermos, about 10 miles north-north-westward, there is a bight, backed by high mountainous land. Lavan (Levani), a mountain, 2,923 feet (890^m9) high, stands about 5 miles north-north-eastward of Cape Kefali and 1½ miles inland.

Georgantas bank, with a depth of 1½ fathoms (2^m3) over it, lies 4½ miles northward of Cape Kefali and about half a mile offshore; with this exception, the depths are considerable at a distance of half a mile offshore.

Chart 1589, plan of Port Palermo.

Grava bay, open southward, is situated at the northern end of this bight, about a mile eastward of Kep i Palermos. The monastery of Shën Dhimitër (Demetrio) is situated about a quarter of a mile inland from the head of this bay and is overlooked by Fort Borsh, which stands on the summit of a hill, 994 feet (303^m0) high, about 1½ miles further east-north-eastward; Qeparo, a village, stands on the slopes of the coastal mountains, about 1½ miles westward of Fort Borsh. Kep i Palermos, the south-western extremity of a peninsula, is 338 feet (103^m0) high. See view facing this page.

Portë e Palermos.—Lights.—Portë e Palermos lies on the western side of a high ridge of land and is entered between Kep i Palermos and Cape Kavadoni, the termination of a tongue of land which slopes gradually southward, about a mile north-westward. The port is open south-westward but its south-eastern part is sheltered by the peninsula. On the north-eastern side of the port, off the village of Shën Koll (Nicolo), situated about three-quarters of a mile northward of Kep i Palermos, there is a small projection with a fort on it. Armarida bay, the bottom of which consists of mud, lies in the northern part and is sheltered from all but south-westerly winds. Panormo and Sinikol bays are situated in the south-eastern part.

The prevailing wind should be considered in the choice of an anchorage; the shelter is good, but the depths increase so rapidly offshore that anchors often drag in a Bora. The bottom is rocky in various parts of the port.

Charts 2701, 1440, 2158a, 2158b.

Mt. Eliaz.

Majë e Qorrës. Majë e Çikës.

Pyluri.



Rrugë e Bardhë. Paljarsa. Drymades. Vesos. Imara.

Mt. Sopoti.



Portë e Palermos. Qçpero. Fort Borsh. Përtërtion. Lubovo. Cape Kefali.

View in 2 parts of coast from Rrugë e Bardhë to Cape Kefali.

(Original dated 1912.)

To face page 105.

Mt. Likorun.

Shën Vasil.



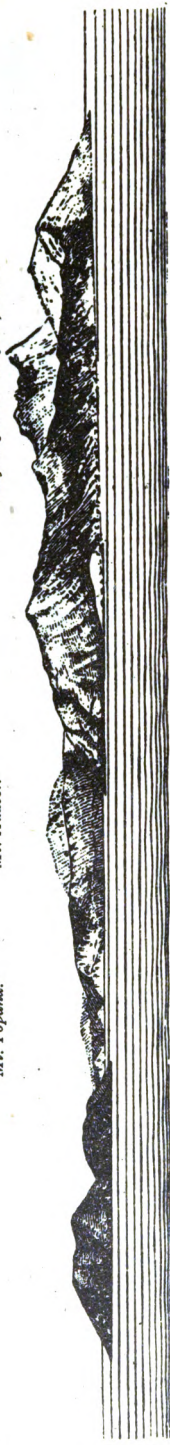
Li. Ho. Sazan I.

Cape Linguetta.
Cape Linguetta from south-westward.
(Original dated 1910.)

Mt. Topana.

Mt. Kudesi.

Majë e Qorrës. Majë e Çikës.



*Sazan
Li. Ho.*

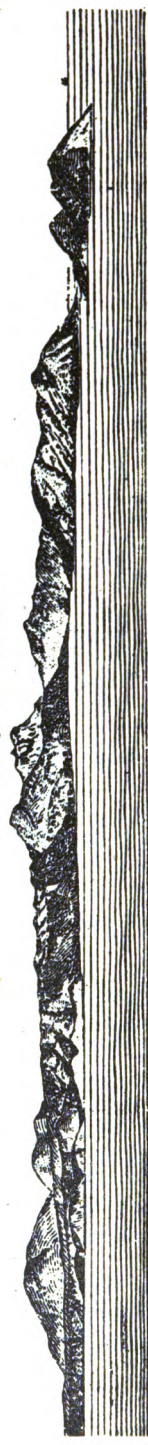
Vlonë.

*Cape Linguetta,
bearing 112°.*

Orso Cove.

Entrance to Gji i Vlonës from westward.
(Original dated 1910.)

*Majë e Majë e
Çikës. Qorrës. Mt. Elias.*



Portonovo.

Gji i Vlonës.
Entrance to Gji i Vlonës from northward.
(Original dated 1910.)

Sazan I, bearing 180°.

Chart 1589, plan of Port Palermo.

The shore on the eastern side of the entrance should not be too closely approached as it is fringed by rocks, awash, in places.

Portë e Palermos may be identified from a distance by Fort Borsh and the village westward of it.

A light is exhibited on the coast about half a mile north-westward of Cape Kavadoni (*Lat. 40° 03' N., Long. 19° 47' E.*).



Cape Kavadoni light-structure.

A light is exhibited, at an elevation of 82 feet (25^m0), from a wooden post, 6 feet (1^m8) in height, on the western edge of the fort near the village of Shën Koll.

Chart 2701.

Coast.—From Portë e Palermos to Cape Linguetta, about 31 miles north-westward, the coast is precipitous and almost inaccessible. It is formed by the termination of the western slopes of a high mountain range culminating in Majë e Çikës (Cika), 6,644 feet (2,025^m1) high and 3 miles inland. Along this coast there are only a few small coves, which afford no shelter; it is dangerous as a lee shore for small sailing craft, south-westerly gales blowing directly on to it. The current sets almost constantly north-westward.

Rrugë e Bardhë (Strade bianche), about 12 miles north-westward of Kep i Palermos, is a remarkably conspicuous white watercourse which, descending steeply from Majë e Çikës, presents the appearance from many miles seaward of a broad white patch. It approaches the sea about 3 miles south-westward of Majë e Çikës, which, with Majë e Qorrës (Kiore), another almost equally high peak, about 2 miles north-westward of it, are visible in clear weather from a great distance. See views facing page 164 and this page.

Cape Linguetta, called Kep i Gjuhëzës by the Albanians, is the north-western extremity of a peninsula, which is a continuation of the coastal range of mountains, Mal i Koret or Shën Vasil, 2,749 feet high, being situated about 4 miles south-south-eastward of the cape. See view on chart 1589 and view facing this page.

Chart 1589, plan of Valona bay.

Island in approach to Gji i Vlonës.—Sazan, an island, called Isola di Saseno by the Italians, 1,086 feet (331^m0) high and steep-sided, lies in the approach to Gji i Vlonës with its southern extremity about 3 miles northward of Cape Linguetta. It has two conical hills which, at a distance, give it the appearance of two islands; its sea

Charts 2701, 1440, 2158a, 2158b.

Chart 1589, plan of Valona bay.

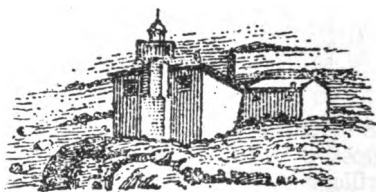
face has several caves and clefts in the rocks, the abode of pigeons. There is a signal station on the summit of Sazan (*Lat. 40° 30' N., Long. 19° 17' E.*).

- 5 Baia di S. Nicolo is situated on the north-eastern side of Sazan ; Porto S. Nicolo, formed by a breakwater, extending in a north-easterly and easterly direction, on its north-western side, and a short mole, on its south-eastern side, lies near the south-eastern end of this bay. The width between the head of the breakwater and the molehead is
10 about 100 yards (91^m4). There is a small pier with a least depth of 6 feet (1^m8) alongside, and 10 feet (3^m0) at its head, extending from the south-western side of the port.

- Owing to the presence of submarine cables, anchorage is prohibited off the coast of Sazan, except within the area defined by an imaginary
15 line drawn from the molehead on the southern side of the entrance to Porto S. Nicolo, in a 025° direction for a distance of 5½ cables and then in a 277° direction to the coast of the island.

- Lights.—Beacons.**—A light is exhibited, at an elevation of 651 feet (198^m4), from a masonry tower and
20 dwelling, 44 feet (13^m4) in height, situated on the western coast of Sazan, about three-quarters of a mile from its northern extremity (*Lat. 40° 30' N., Long. 19° 16' E.*). *See view.*

- 25 A light is occasionally exhibited from Punta Frana, on the eastern side of the island, about a mile from its southern extremity.



Sazan lighthouse.

- A light is exhibited, at an elevation of 29 feet (8^m8), from a concrete
30 post on a masonry base, 10 feet (3^m0) in height, on the head of the breakwater and a similar light is exhibited on the molehead at Porto S. Nicolo.

- Two iron framework structures, each carrying a white daymark with black stripes, situated on the south-western shore of Baia di S.
35 Nicolo, when in line, bearing 242°, lead into Porto S. Nicolo, over a least depth of 14 feet (4^m3).

- Gji i Vlonës.—Lights.**—Gji i Vlonës, formerly known as Valona bay, is entered between Kep i Karlovecit (Garlovez), about 2 miles north-eastward of Cape Linguetta, and Kep i Treportit or Kep i
40 Trelimës, about 5 miles north-eastward. *See view on chart 1589 and views facing page 165.*

- Kep i Treportit is a mixture of earth and rocks, 197 feet (60^m0) high, and forms some contrast to the general aspect of this low, sandy part of the coast ; it is fringed by sunken rocks extending about three-
45 quarters of a cable offshore.

- A bank, with depths of less than 10 fathoms (18^m3) over it, extends about 4 miles south-westward from Kep i Treportit. Between Kep i Treportit and Pelasja (Pelasia) point, about 5 miles south-eastward, the north-eastern side of the bay is low and sandy, bordered by a
50 shallow bank, which is about a mile wide a short distance southward of the former cape ; this part of the shore should be approached with caution as the bank was reported to be extending, in 1883. For a distance of about 5 miles further southward, the eastern side of the bay is backed by hills. On this side of the bay there are two con-

Charts 2701, 1440, 2158a, 2158b.

Chart 1589, plan of Valona bay.

spicuous white houses, about 6 and 8 cables, respectively, south-south-westward of Pelasja point.

The south-western side of Gji i Vlonës is high and almost precipitous, rising to Mal i Koret, previously mentioned.

The shore of Gji i Dukatit, which lies at the head of the bay, is low, and just within it is Pellg i Dajlanit (Paschiliman sea), in the vicinity of which the land is marshy.

A stream flows into the sea on the western side of the bay, and Izvor (Nisvoru), a river, which abounds in trout, flows into the eastern side of the head of the bay. There is good seining in Gji i Dukatit, and good shooting can be had in Pellg i Dajlanit.



*Light-structure
about a mile south-south-westward
of Pelasja point.*

There are two piers at the landing place for Vlonë, about $4\frac{1}{2}$ miles south-eastward of Kep i Treportit; the inner, or eastern, pier has a depth of 2 fathoms (3^m7) at its head; the western pier is disused.

A light is exhibited, at an elevation of 107 feet (32^m6), from an iron framework tower with a hut at its base, on a point (Lat. $40^\circ 25' N.$, Long. $19^\circ 29' E.$), about a mile south-south-westward of Pelasja point.

Two lights, disposed vertically, are exhibited, one at an elevation of 54 feet (16^m5), and the other at an elevation of 48 feet (14^m6), from a structure on the coast about $1\frac{3}{4}$ cables southward of Pelasja point.

A light is exhibited at the head of the eastern pier.

Anchorage.—Prohibited area.—Vessels visiting Gji i Vlonës in the summer, for a short stay, generally anchor off the coast between the landing place for Vlonë and Pelasja point, in depths of from 10 to 13 fathoms (18^m3 to 23^m8), mud and weed. Care should be exercised, when anchoring, to ascertain the nature of the bottom, for H.M.S. *Broke*, in 1928, anchored with Pelasja point bearing 134° , distant 9 cables, found that the ship dragged rapidly in squalls, the bottom being bare rock. North-westerly winds cause a heavy sea at this anchorage and the Bora is severely felt. Vessels intending to make a longer stay should anchor in Gji i Dukatit at the head of the bay where there is shelter from all winds, but the holding ground is reported to be unreliable; the best anchorage is stated to be about 6 cables north-westward of the mouth of Izvor river, in a depth of 16 fathoms (29^m3), stiff mud. Raguzeo cove, on the western side of the bay about $2\frac{1}{4}$ miles from the head, in which the depths are from 10 to 12 fathoms (18^m3 to 21^m9), is well sheltered; this bay is only suitable for small craft.

Vessels are forbidden to approach or anchor within a radius of 750 yards (685^m8) of the two lights situated $1\frac{3}{4}$ cables southward of Pelasja point, between the bearings of 095° and 128° .

Pilotage is compulsory.

Telegraph cable.—A cable, indicated on the chart, leaving the shore about $1\frac{1}{2}$ miles westward of Vlonë, passes between Cape Linguetta and Sazan, and thence to Otranto. A vessel must not anchor in the vicinity of this cable.

Charts 2701, 1440, 2158a, 2158b.

Chart 1589, plan of Valona bay.

Vlonë.—The town of Vlonë, formerly called Valona, known locally as Vlorë, stands at the foot of a cultivated hill, about a mile north-north-eastward of the landing place. The hills south-eastward are thickly covered with olive trees. Salt and olive oil are the principal products; asphalt is exported.

The population, in 1940, was about 8,000.

Vlonë is in steamer communication with other ports in the Adriatic.

Charts 1589, plan of Valona bay, and 2701.

- 10 **Directions.**—When making the land from north-westward, until Sazan is seen, a course should be steered for the high mountains of the interior, which are snow-covered. In passing the mouth of Vjosë (Vojuca) river, about 10 miles north-north-westward of Kep i Treportit, the coast should not be too closely approached on account of the shallow bank which borders it, and sounding should be continuous; the current sets northward. See Caution, page 169.

The depths in the southern channel, between Cape Linguetta and Sazan, are considerable, but the north-east-going current through this channel should be borne in mind, though it is not strong except during south-easterly winds, when it is advisable for a sailing vessel to borrow rather upon the southern side. During these winds a good look-out must be kept for violent squalls from the high land.

Chart 2701.

- Aspect of coast.**—Between Kep i Treportit and Shëngjin, about 25 80 miles northward, the high lands in the interior disappear, except in the vicinity of Durrës (Durazzo), which lies about midway between them. Inland of Shëngjin, there is a vast sandy plain, intersected by marshes and bounded by mountains. From the mouth of the Buenë or Bojana river, about 10 miles west-north-westward of Shëngjin, to the neighbourhood of Ulcinj, 8 miles further west-north-westward, the country is flat near the sea; thence it becomes higher, and is backed by mountains.

- Almost the whole coast of Albania is composed of sandy bays, interrupted occasionally by high, steep, rocky points. Between Vlonë and 35 Ulcinj (*Lat. 41° 55' N., Long. 19° 13' E.*), the offshore depths are comparatively slight, and the bottom is affected during heavy rains and when the rivers are swollen; off the coast of Yugoslavia, between Ulcinj and the entrance to Boka Kotorska, about 41 miles north-westward, the depths are generally greater.

- 40 The coast from Luka Bar, about 12 miles north-north-westward of Ulcinj, to Boka Kotorska is backed at a short distance inland by a mountainous chain, and is generally steep-to. The adjacent country is populous, well wooded and fertile.

- From Gji i Vlonës to Kep i Lagit (Laghi) or Gagji, about 40 miles 45 northward, there are few, if any, remarkable navigational objects. The shore is one uninterrupted sandy beach with numerous small sandhills, and, within it, there is a barren plain intersected by marshes and lakes as far as the hills in the interior. The coast affords no shelter, and is everywhere bordered by shallow banks, extending, in 50 places, as much as 3 miles offshore.

The utmost caution should be exercised when approaching this portion of the coast, and, at night, it should be given a wide berth.

Coast.—Between Kep i Treportit and Kep i Lagit, three rivers flow into the sea. The mouth of Vjosë river is situated about 10 miles

Charts 1440, 2158a, 2158b.

To face page 169.

Maj e
Tomorrit. *Mali*
Tomorrit. *Vari i Abas Aliut.*



Soly swamp

Mt. Signa.
Mt. Likovun.

Mali Tomorrit from westward, distant 10 miles from the coast.
(Original dated 1910.)

Mt. Spadh.

Mali Tomorrit.



Ardenica Monastery.

Coast from Shkumbi river to Seman river.
(Original dated 1910.)

Chart 2701.

north-north-westward of Kep i Treportit. A bank, with depths of less than 5 fathoms (9^m1) over it, extends about a mile off the salient points of this stretch of coast.

Samana point lies about 8 miles northward of the mouth of the Vijosë river, with a shallow bight between. It was reported, in 1939, that the shape of Samana point was incorrectly delineated on the chart; and that there were some houses on the cape.

The mouth of Seman (Semeni) river lies about 6 miles north-eastward of Samana point with Pietrit bay between; depths of less than 5 fathoms (9^m1) extend about 2 miles from the head of this bay. The source of the Seman river is near Mal i Tomorrit (Tomor), about 36 miles inland. The monastery of Ardenicë (Kloster Ardenizza), which is conspicuous, stands on a hill, 662 feet (201^m8) high, about 12 miles eastward of Samana point.

The mouth of Shkumbi (Skumbi) river lies about 8 miles northward of that of the Seman river.

It was reported, in 1939, that a sandy point extended about 3 miles from the coast about midway between the mouths of these two rivers.

Chart 1590.

Kep i Lagit (*Lat.* 41° 09' N., *Long.* 19° 26' E.), which lies 8 miles northward of the mouth of the Shkumbi river, is covered with brushwood and has a church on its summit. See views facing this page.

Caution.—The mouths of the rivers described above are subject to great alterations; the alluvial deposit forms banks, which extend some distance offshore and are constantly increasing in extent. Depths less than those indicated on the chart were reported, in 1913, off the coast of Albania and considerable alterations of coastline have been reported between the mouth of the Vijosë river and Pellg i Drinit 60 miles northward.

Gji i Durrësit.—Gji i Durrësit (formerly Durazzo bay) is entered between Kep i Lagit and Kep i Durrësit (formerly Cape Durazzo), on which there is a round hill like a sugar loaf, 367 feet (111^m9) high, about 10 miles northward. These two capes form a contrast to the shore of the bay, which is low and bordered by a bank, with depths of less than 3 fathoms (5^m6) over it, about a mile wide. The bay is obstructed by off-lying shoals, westward of which the depths increase somewhat rapidly. In south-westerly and westerly winds, when the weather is thick or hazy, the land about the bay is difficult to distinguish.

The rivers Darç (Darci) and Leshniqe (Kavajë) flow into the south-eastern part of the bay.

Conspicuous objects are; a round tower on the hill above the town at the northern end of the bay; a white church with a red roof and a high square tower with a low spire, situated near the southern end of the town; and the minaret of the mosque in the centre of the town.

Dangers.—**Buoyage.**—Between Kep i Lagit and the mouth of the Darç river, about 4½ miles north-north-eastward, the shore bank, with depths of less than 5 fathoms (9^m1) over it, is about 2 miles wide. On this bank there are several detached, shallow, rocky patches, the positions of which can best be seen on the chart. A detached, rocky 2½-fathom (4^m6) patch lies westward of the shore bank, about a mile north-north-westward of Kep i Lagit, and a rocky patch, with a least depth of one foot (0^m3) over it, and which breaks, lies 3½ miles north-north-eastward of Kep i Lagit and 1½ miles offshore.

Charts 2701, 1440, 2158a, 2158b.

Chart 1590.

Selada shoals, with a least depth of $1\frac{1}{2}$ fathoms (2^m3) over them, lie about $3\frac{1}{4}$ miles northward of Kep i Lagit and $2\frac{1}{4}$ miles offshore, with two $4\frac{1}{2}$ -fathom (8^m2) patches between them and the rocky patch which
5 breaks.

Durrës (formerly Durazzo) banks consist of a reef, over which the depths are uneven, extending about 2 miles southward of Kep i Durrësit; for a distance of about $1\frac{1}{2}$ miles southward of the cape, this reef has depths of less than 3 fathoms (5^m5) over it. The southern end
10 of this portion of the reef is marked by a conical buoy.

Talbot shoal, a detached portion of Durrës banks, with a least depth of 2 fathoms (3^m7) near its northern end, lies from about $1\frac{1}{2}$ to 2 miles southward of the cape. A light-buoy, painted red, and exhibiting a
15 *white flashing light every five seconds*, marks the southern end of this portion of the banks.

A detached $1\frac{1}{2}$ -fathom (2^m7) patch lies on the coastal bank, eastward of Durrës banks, about 4 cables south-westward of the southern molehead in the harbour.

Harbour.—Lights.—Buoy.—The harbour of Durrës is situated
20 south-eastward of the town and is formed by two moles, the eastern extending about 7 cables offshore in a south-south-westerly direction and the south-western, in a south-easterly and easterly direction, leaving an entrance, about a cable wide, between the moleheads; there is also a pier running in a south-easterly direction near the middle
25 of the harbour. In 1939, there were depths of about 10 feet (3^m0) in the middle of the north-eastern part of the harbour; in an area in the south-western part there were depths of about 22 feet (6^m7), and in the entrance, the depth was about 20 feet (6^m1).

A conical buoy, moored $2\frac{1}{2}$ cables east-north-eastward of the southern
30 molehead, marks the northern end of the approach channel.

A light is exhibited from each molehead.

Leading lights are exhibited from iron framework structures, 20 feet (6^m1) in height; the front light, near the root of the eastern mole, the rear light, about $4\frac{1}{4}$ cables northward of the front light.

35 **Anchorage.**—There is anchorage for small vessels about one mile south-eastward of the entrance to the harbour.

Directions.—Approaching the harbour, Shkamb i Kavajës (Sasso bianco), a white cliff, on the eastern shore, about 4 miles south-eastward of Kep i Durrësit, is conspicuous and should be brought to bear
40 083° and steered for until the leading light-structures are in line, bearing 000° , when they should be kept so until close to the entrance to the harbour.

When Kep i Lagit is obscured and Shkamb i Kavajës cannot be seen, it is not prudent to approach the harbour.

45 **Pilotage** is compulsory.

See views facing this page.

Town.—The town of Durrës (formerly Durazzo) (*Lat. $41^\circ 19' N.$, Long. $19^\circ 26' E.$*) is walled and fortified, and is the chief centre of Albanian commerce and the port for Tiranë, the capital. In 1940,
50 the population numbered about 10,000.

There is frequent steamer communication with other ports in the Adriatic. *See view facing this page.*

Malaria is prevalent in summer, and Europeans suffer from bowel complaints. Water must be boiled before use.

Charts 2701, 1440, 2158a, 2158b.

Kavaja.

Kamsa Gër.

Mal i Tomorrit.

Mt. Kudas.



Kep i Lagü.

*Kodra Shodrit, in line
with Kamsa Gër, bearing 129°*

Gji i Durrësit.

Mt. Daldit.

Mt. Briskes.

Mal i Kjel.



Mt. Trafolin.

*Shkamb i Kavajës,
bearing 083°, leads southward of Talbot shoal.*

Gji i Durrësit.

*Vels Gëpjet.
Mt. Kalmeti.*



Durrës.

Mal i Durrësit.

Kep i Durrësit.

Lookout house.

*Durrës bearing 017°, distant 2½ miles.
(Originals dated 1910.)*

Kep i Palit.

To face page 171.



Watch-house. Lighthouse (disused).

Kep i Rodonit, bearing 180°, distant 4 miles.
(Original dated 1910.)

Mali Kalmeti.

Mali Altai.

Mala Bokian.



Mali Rensit.

St. Giovanni's point.

Drin R.

Podona.

Mat R.

*Mt. Krna
or Kroja.*

Mt. Droi.

Mt. Daldit.



Kurbini.

Zaplia.

View in 2 parts of Pellg i Drinit.
(Original dated 1910.)

Chart 2701.

Coast.—From Kep i Durrësit, the coast trends $6\frac{1}{2}$ miles north-north-westward to Kep i Palit and is bordered by a rocky bank, with depths of less than 5 fathoms (9^m1) over it, about three-quarters of a mile wide. Mal i Durrësit, 604 feet (184^m1) high, stands close to the coast, about $1\frac{1}{2}$ miles northward of Kep i Durrësit. An extensive swamp is situated a short distance inland. 5

Kep i Palit is hilly, tree-covered, and 187 feet (57^m0) high; it projects about $1\frac{1}{2}$ miles north-westward, the extremity being rather lower than the middle; a reef extends about half a mile north-westward of the cape and a spit, with depths of less than 5 fathoms (9^m1) over it, extends about half a mile further north-westward. 10

Between Kep i Palit and Kep i Rodonit, about 11 miles north-north-eastward, there is a bight, the sandy beach of which is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which is as much as 3 miles wide in the southern part. 15

There is a roadstead in the southern part of this bight, between Kep i Palit and the mouth of Erzen (Arzen) river, 3 miles north-eastward. This roadstead only affords shelter from south-westerly winds to small craft. 20

Gji i Lalzës (Lales) is situated in the north-eastern part of the bight. The coastal bank, with depths of less than 5 fathoms (9^m1) over it, extends about 2 miles off the head of this bay. A lake lies close inland, a short distance northward of the Erzen river, and two streams flow into the bay further northward. 25

Temporary anchorage may be found in the north-eastern part of Gji i Lalzës during a Bora, in depths of from 4 to 7 fathoms (7^m3 to 12^m8), mud, at a distance of from one to 2 miles offshore. 25

The promontory which terminates in Kep i Rodonit is 675 feet (205^m7) high at a distance of 3 miles east-south-eastward of its extremity, which is steep and bare; elsewhere the promontory is covered with vegetation and trees. It stands up conspicuously from the low land northward and southward of it and is a good landmark. See view facing this page. 30

Kep i Rodonit has a lighthouse on it, disused since 1924; it is bordered on both sides by a shallow bank and a spit, with uneven depths of less than 10 fathoms (18^m3) over it, extends about 2 miles west-north-westward of it. 35

PELLG I DRINIT.—General remarks.—Pellg i Drinit (Gulf of Drin) is entered between Kep i Rodonit (*Lat.* $41^\circ 35' N.$, *Long.* $19^\circ 27' E.$) and Rt Mendra (Menders), about 26 miles north-westward. The bay affords good anchorage all along its shores with offshore winds; the Bora, at times, blows here with violence. A vessel should sound constantly when approaching its shore, as it is bordered by a shallow bank extending a considerable distance offshore, in places, especially at the mouths of the several rivers. The most important rivers are Ishm (Jsmi), Mat (Matja), Drin and Buenë. See views facing this page. 40

Southern and eastern sides of gulf.—Rodoni roads, situated eastward of Kep i Rodonit, afford the best anchorage in Pellg i Drinit; here a vessel is sheltered from south-westerly winds. Vessels can anchor from $2\frac{1}{2}$ to $2\frac{1}{2}$ miles eastward of Kep i Rodonit and about a mile off the southern shore. Small vessels may go farther in. 50

Drin river, the mouth of which is situated about 11 miles north-

Charts 1440, 2158a, 2158b.

Chart 2701.

north-eastward of Kep i Rodonit, is the largest of the four rivers previously mentioned, except the Buenë river, and is navigable by boats as far as Lesh (Alessio), a small town on a hill in a fertile plain, on the eastern bank, about $4\frac{1}{2}$ miles from the mouth.

Chart 1463, plan of Port St. Giovanni di Medua.

Shëngjin.—The town of Shëngjin (formerly St. Giovanni di Medua) is situated about 4 miles northward of the mouth of the Drin, where the land becomes high. Its position can be identified by St. Giovanni point, which forms the western side of its small harbour; this cape is the south-eastern extremity of the only spur of the neighbouring ridge of hills whose base reaches the sea. This strip of rocky coast is about a mile long, and southward and north-westward of it, a sandy beach extends for a considerable distance. On the hill close above the cape there is a large conspicuous, yellow building with a red roof and there are other buildings on the cape, visible from south-westward. On the hill about three-quarters of a mile north-eastward of the cape, there is a white wooden cross on a white stone pyramid.

The harbour is in a small bay eastward of St. Giovanni point and is obstructed at its entrance by shallow banks extending from both sides, between which, on the eastern side, there is a narrow, shallow channel leading into the bay; this channel is only suitable for small vessels, with local knowledge. Within, there are depths of about 22 feet (6^m7).

A shallow bank, about three-quarters of a cable wide, extends from the north-eastern side of the bay, and a detached bank, with a depth of 2 feet (0^m6) over it, lies near the middle of the bay, about 3 cables north-eastward of the light-structure on the western entrance point.

There is a mooring buoy in the south-western part of the bay, to which a vessel, having anchored, can secure her stern. There are three small piers. The harbour is sheltered from all winds.

The town of Shëngjin, which is unhealthy in summer, is situated on the western side of the bay and there are a Health office and a Customs house, situated in a small house close to the landing pier.

A small quantity of provisions can be obtained. There is a water boat with a capacity of 5 tons; the water is not fit for drinking.

There is steamer communication with other ports in the Adriatic.

Lights.—Beacons.—A light is exhibited from a masonry structure, 8 feet (2^m4) in height, on St. Giovanni point (*Lat.* 41° 49' N., *Long.* 19° 35' E.).

A light is exhibited from a post on the north-eastern side of the entrance channel, about half a mile east-north-eastward of St. Giovanni point light-structure; a beacon stands close north-north-eastward of this light.

A light is exhibited from an iron column on the south-western side of the entrance channel, about 4 cables east-north-eastward of St. Giovanni point light-structure; a beacon stands close north-westward of this light.

Anchorage.—There is anchorage with St. Giovanni point bearing 023°, distant about $1\frac{1}{4}$ miles, in a depth of 11 or 12 fathoms (20^m1 or 21^m9), sand and mud; although this berth is exposed south-westward, it is reported to be safe, as a gale from this quarter is unknown, and it is well sheltered from the Bora and Scirocco.

There is anchorage with St. Giovanni point bearing 355°, distant

Charts 2701, 1440, 2158a, 2158b.

To face page 173.

Mt. Lata. Mt. Rumbje.



Kamen
Oderent.

Ulindj. Mt. Molara.

About 1000',
2½ miles.

Sr. Nikola
church. Health Office.
Buena river.

Approach to the mouth of the Buena river from the southward.

(Original dated 1910.)

Chart 1463, plan of St. Giovanni di Medua.

3½ cables, in depths of from 7 to 8 fathoms (12^m8 to 14^m6), mud. Small vessels can anchor farther in, in a depth of 5½ fathoms (10^m1).

Chart 2701.

Northern side of gulf.—Off-lying islet.—From Shëngjin the coast trends about 22 miles west-north-westward to Rt Mendra. From about 2½ miles north-westward of St. Giovanni point to Rt od Derana, about 14 miles farther west-north-westward, the coast is generally low. The mouth of the Buenë river, described below, is situated about 6 miles east-south-eastward of the latter point. The entrance of this river should be given a wide berth, as the shifting bank, with depths of less than 5 fathoms (9^m1) over it, fronting the delta, extends nearly three-quarters of a mile offshore.

The land is low, well-wooded, and level for some miles inland to the base of the mountains.

The small village of Pulaj (Pulej), consisting of white houses with red roofs, situated on the eastern bank of the Buenë river, about 1½ miles inland, is conspicuous. A large white church stands on a small hill above this village. There is a small pier with a depth of 5 feet (1^m5) alongside its head; there is also a health office, and no communication with the shore is permitted, and no boats allowed to proceed up the river, until pratique has been obtained.

Sveti Nikola, a small village, in which there is a church, stands on the western bank, about half a mile north-westward of Pulaj.

The 102-foot (31^m1) hill, about a mile west-north-westward of Sveti Nikola church, is noticeable, as it rises above the surrounding trees, and is covered with bushes and large bare patches of red earth, the latter being conspicuous. The 82-foot (25^m0) hill, close north-eastward of Pulaj is not noticeable. See view facing this page.

Kamen Oderane (Guri Geranis), 13 feet (4^m0) high, and of a light reddish colour, lies about 2 miles south-eastward of Rt od Derana and a mile offshore. A rock, with a depth of less than 6 feet (1^m8) over it, and which is steep-to, lies close southward of this islet.

Landing can nearly always be effected at the mouth of the small river close eastward of Rt od Derana.

Between Rt od Derana and Rt Mendra, about 5 miles west-north-westward, the coast rises to hills from 200 to 500 feet (61^m0 to 152^m4) high. The walled town of Ulcinj is situated about 2 miles west-north-westward of Rt od Derana. This town is in the form of an amphitheatre on rather high ground and is conspicuous. See view facing page 175. The population was about 3,750, in 1931.

Rt Mendra, covered with shrubs and of a dark green colour, projects north-westward and rises to a hill, 430 feet (131^m1) high, three-quarters of a mile east-south-eastward of its extremity. There is a reef lying close offshore about 7 cables south-eastward of Rt Mendra.

Lights.—A light is exhibited, at an elevation of 56 feet (17^m1) from an old fort at Ulcinj (*Lat. 41° 55' N., Long. 19° 12' E.*).

A light is exhibited, at an elevation of 111 feet (33^m8), from a grey octagonal concrete tower, 23 feet (7^m0) in height, on Rt Mendra.

Buenë river.—Buenë or Bojana river has its source in Liqen i Shkodrës (formerly Lake Scutari) and flows into the sea about 10 miles west-north-westward of Shëngjin. Near its mouth it divides into two branches, forming a considerable delta overgrown with rushes. For such vessels as can enter, the river is navigable nearly up to Liqen i

Charts 1440, 2158a, 2158b.

Chart 2701.

Shkodrës, and vessels of about 150 tons can go more than half the distance. During heavy rains, the current is very rapid and overflows the banks, and the mouth is subject to considerable change. The distance by the river to Shkodër (Scutari) is about 24 miles; it has been repeatedly ascended by boats from H.M. ships without difficulty.

The south-eastern entrance in June, 1914, was the deeper, and there was then a depth of about $4\frac{1}{2}$ feet (1^m4) on the bar. The seaward side of the bar is very steep, the depths decreasing from 5 fathoms (9^m1) to one fathom (1^m8) in a distance of about half a cable. Within, the depths increase to 7 feet (2^m1) and more. The passage is marked by stakes; there is always one in position and sometimes more, but there is no indication on which side they should be passed.

The bar often breaks from a swell when it is practically calm at the anchorage, and a comparatively light local wind from seaward will quickly raise a surf. A southerly wind increases the depths on the bar, but at the same time raises a sea.

The rise of the tide is about one foot (0^m3), and the state of the tide influences the conditions on the bar considerably. There is good anchorage inside the bar anywhere seaward of Pulaj (*Lat.* 41° 52' N., *Long.* 19° 24' E.) in depths of from 8 to 15 feet (2^m4 to 4^m6), sand and mud.

The river presents no difficulty, as the probable positions of the banks can usually be easily seen. A pilot is necessary for a stranger.

In the bends at Luarez and at Belaj (Biela) there are strong tide-rips, and care is necessary in steering.

The hill at Luarez is a rocky knoll with scrub on its sides.

A small tributary, the outlet from Šasko (Šašit) jezero, joins the river at Sveti Đorđe (Gjorgje); at the junction, in 1914, there was a corn mill with a tall chimney.

The hills, on the southern bank below, and on the western bank above, Belaj, are steep and rocky.

In the reach above Goricë, there are extensive shallow banks along the south-eastern side, while, about half-way along the reach, there is a shallow bar, which had a depth of 5 feet (1^m5) over it in June, 1914, but was reported to have 2 feet (0^m6) less over it at low river. Above Obot, navigation of the river becomes more difficult, and just below Daragjat (Daragathe) there is a crossing, which, in 1914, had a depth of about $4\frac{1}{2}$ feet (1^m4) over it.

The village of Obot consists of a barracks, a few stone houses, and some thatched cottages. Steam vessels frequently cannot proceed higher, and hulks are moored for them to lie alongside and discharge their cargo.

At the junction of the Buenë and Drin i madh (Drinassa) rivers, there are considerable mudbanks and a number of islets covered with reeds and bushes; care is necessary here, particularly if towing boats, as the crossing is shallow (there was a depth of 5 feet (1^m5) over it, in June, 1914), and the current is very strong and sets across the channel, so that if caution is not used, the last boat of the tow may swing into the bank. Abreast the citadel, there is a cliff on the north-western bank just at a bend; the current sets directly on to this cliff and forms a strong race, which requires attention in steering.

Immediately above this, two lines of stakes indicate the channel, which then leads between two reed-covered islets. There are two sets of stakes, one on each side of the river; those on the eastern side are the ones to pass between.

Charts 1440, 2158a, 2158b.

To face page 175.

Mt. Kosa. Mt. Lisin. Mt. Mraured. Mt. Mohara.



Ri Mendra
Li. Ho.

Mt. Kraci.

Ulcinj.

Ri od Derava.

Ulcinj from the south-south-westward.
(Original dated 1910.)

Chart 2701.

There is anchorage above or below the bridge, above it being the better as there is less current. One section of the bridge can be moved for vessels unable to proceed under it.

In June, 1914, the pilot boat towing a launch, two cutters and a whaler, all laden, ascended the river in 7 hours, and returned in about 2½ hours.

The current was estimated to run at the rate of 2 knots in the lower reaches of the river, 3 knots at Obot (*Lat. 41° 59' N., Long. 19° 26' E.*) and 4 knots just below Shkodër. With a higher river the rate would be greater, and the pilot stated that it attains a rate of about 6 knots.

Pilotage.—Pilots can be engaged at Pulaj, or through the Harbour master at Shëngjin.

Shkodër.—The small city of Shkodër (formerly Scutari) is situated on the slope of a hill, crowned by a fort, and on the plain about 2 miles from the south-eastern end of Liqen i Shkodrës.

It had a population of about 24,000 in 1927.

Liqen i Shkodrës.—The margin of Liqen i Shkodrës or Skadarsko jezero is even except at its north-western end and on its north-eastern side, where an arm extends about 6 miles to the North Albanian mountains. The mouth of a river is situated at the north-western end of the lake and several rivers flow into its north-eastern side, the principal of which is the Morača, near the northern end.

The lake is very shallow at its north-western end, but there are some deep holes off the south-western shore.

The lake is about 20 feet (6^m1) above the sea level; the amount of water in it is liable to fluctuation and Shkodër is sometimes flooded.

Virpazar, at the north-western end of the lake, is connected by rail with Bar, about 10 miles southward. There is a depth of 8½ feet (2^m5) in the channel leading to the railway quay at Virpazar and there is a crane on the quay capable of lifting about 3 tons.

Anchorage.—There is anchorage anywhere off the coast between St. Giovanni point and Ulcinj, during offshore winds and the Bora.

There is anchorage off Buenë river mouth with offshore winds. A good berth, in summer, is in depths of from 7 to 9 fathoms (12^m8 to 16^m5), at the distance of a mile offshore, with the village of Pulaj bearing 02°; or in a large vessel, farther out, in a depth of 11 or 12 fathoms (20^m1 or 21^m9). Anchorage has been obtained with Pulaj bearing 350°, distant 3 miles, in a depth of 12 fathoms (21^m9), mud and good holding ground.

Ulcinj road is an open anchorage off the town, with depths of from 10 to 12 fathoms (18^m3 to 21^m9).

Ulcinj harbour.—There is a small harbour at Ulcinj which affords shelter to small vessels, with local knowledge, during a Bora or north-westerly winds. The harbour is exposed to other winds and is dangerous in south-easterly winds.

There is a small quay in the harbour with a depth of 6 feet (1^m8) alongside.

COAST.—Between Rt Mendra and Rt Volovica (*Lat. 42° 05' N., Long. 19° 04' E.*), about 9 miles north-north-westward, there is a bight. The shore of this bight, for a distance of about 5 miles northward of Rt Mendra, is indented by several coves, whose entrance

Charts 1440, 2158a, 2158b.

Chart 2701.

points are foul to a short distance ; a vessel may anchor off this part of the coast, but the coast must be closely approached in order to obtain suitable depths in which to anchor.

- 5 Uvala Orašac (Noce), on the northern side of Rt Mendra, has anchoring space near the Customs house for a few small vessels, in north-easterly and easterly winds. The land rises immediately over the northern side of the bay to an elevation of 1,447 feet (441^m0). Vessels, with local knowledge, can anchor in the southern part of this bay, off
10 a rock painted white, situated about 2½ cables westward of the Health office.

Otočić Stari Ulcinj, with a building on it, lies close off the northern entrance point of Uvala Kruče, the second bay northward of Rt Mendra ; there are some above-water and sunken rocks between this islet and
15 the shore.

Charts 1463, plan of Bar roads, and 2701.

- Luka Bar.**—This harbour is situated at the southern end of a bay which is entered between Rt Volovica and Rt Rotac (Ratec), on which there are some ruins, about 2 miles north-north-westward. There is a
20 sandy beach along the southern and eastern shores of the bay ; the north-eastern shore is rock, and forms part of the base of Mount Petilje, 2,350 feet (716^m3) high, situated 1½ miles north-eastward of Rt Rotac. On the high land overlooking the bay, and about half a mile south-westward of Mount Petilje, is Fort Sušan, elevated 1,023 feet (311^m8).
25 See view on chart 2701.

This part of the coast is backed by mountainous land. Mount Lisin, 4,528 feet (1,380^m1) high, Mount Rumija, 5,226 feet (1592^m9) high, and Mount Kosa, 3,728 (1136^m3) high, stand about 5 miles south-eastward, east-north-eastward, and north-north-eastward, respectively,
30 of Rt Volovica. See views on charts 2701 and 1463.

The shore bank, with depths of less than 5 fathoms (9^m1) over it, is about half a mile wide in the south-eastern part of the bay and 1½ cables wide in its north-eastern part.

- A stone mole, partially dilapidated, projects about 1½ cables north-
35 north-eastward, about 2 cables south-eastward of Rt Volovica light-tower, forming a small harbour. Vessels drawing from 24 to 16 feet (7^m3 to 4^m9) can berth along the eastern side of this mole, which has a wall 10 feet (3^m0) high, and is connected to the railway running to Virpazar.

- 40 The town of Bar is built on a hill, about 3 miles eastward of Rt Volovica. It is the principal town of a district, and contained, in 1931, about 550 inhabitants.

Chart 1463, plan of Bar roads.

- Lights.**—A light is exhibited, at an elevation of 102 feet (31^m1),
45 from a grey, octagonal, concrete tower, 23 feet (7^m0) in height, on Rt Volovica (Lat. 42° 05' N., Long. 19° 04' E.).

A light is exhibited, at an elevation of 31 feet (9^m4), from a white conical tower, 27 feet (8^m2) in height, on the molehead in Luka Bar.

- Anchorage.**—**Directions.**—A vessel entering this bay should give
50 Rt Volovica a berth of about 3 cables, and can anchor with the light-tower on that point bearing 231°, distant 5 cables, in depths of from 7 to 9 fathoms (12^m8 to 16^m5), mud and good holding ground. Small craft, with local knowledge, can find shelter south-eastward of the mole which affords protection from all winds.

Charts 2701, 1440, 2158a, 2158b.

Chart 1463, plan of Bar roads.

A rock on the coast, half-way between Rt Volovica and the Customs house, about three-quarters of a mile east-south-eastward, has been painted white to facilitate anchoring.

The roadstead being entirely open westward, a vessel must be prepared to take every precaution on the usual indications of adverse weather from that direction.

Winds.—The anchorage is sheltered from all offshore winds and as far round as S.W. by W. ; the strongest winds are off the mountains. In summer there are hard squalls from north-westward with thunder and lightning, but they are soon over.

Charts 1463, plan of Bar roads, and 2701.

Coast.—Between Rt Rotac and Crni rt, about $2\frac{1}{2}$ miles west-north-westward, there is a bight ; Uvala Spič (Sutomore) lies in the eastern part of this bight. The village of Sutomore is situated on the northern shore of this bay. A battery stands on a hill, 288 feet (87^m8) high, $1\frac{1}{2}$ miles eastward of Crni rt.

Maljević bay, open southward, is entered between Crni rt and Krčevac point about 6 cables eastward. A shallow, rocky bank extends $1\frac{1}{2}$ cables from the eastern side of this bay, and a bank, with depths of less than 3 fathoms (5^m5) over it, extends from the head of the bay to within a distance of 2 cables of an imaginary line joining the entrance points ; southward of the outer edge of this bank the bottom consists of coarse sand.

Crni rt (*Lat.* 42° 08' N., *Long.* 19° 01' E.) is steep-to and rises to a height of 515 feet (157^m0), about 2 cables within. From this point, the coast trends about 3 miles north-westward to Rt Dubovica, which is 1,030 feet (313^m9) high ; this point is bordered by a reef about a cable wide on which there is an above-water rock.

Uvala Čanj, at the head of which small craft can shelter during north-westerly winds, is situated midway between Crni rt and Rt Dubovica.

Between Rt Dubovica and the town of Budva, $8\frac{1}{2}$ miles north-westward, the coast is rather bold and steep-to, with the exception of a few above-water rocks lying close offshore and some narrow reefs, fringing the shore in places.

Chart 1463.

Petrovac is situated on the coast about $2\frac{1}{2}$ miles north-westward of Rt Dubovica ; Otočić Sveta Nedelja, which is rocky and rises to an elevation of 108 feet (32^m9), and has some ruins on it, lies about 4 cables southward of Petrovac and 3 cables offshore ; Otočići Katić, two islets close together, one of which is 75 feet (22^m9) high, lie close south-south-westward of Sveta Nedelja. There is a narrow channel, with a depth of 6 fathoms (11^m0) in the fairway, between the reef surrounding these islets, on its south-western side, and the shallow bank extending from the mainland north-eastward. The reef extends about 2 cables south-south-eastward of Otočići Katić and is steep-to.

A reef lies close off Skočić Djevojka point, situated about $1\frac{1}{2}$ miles north-westward of Petrovac.

Debeli rt, 279 feet (85^m0) high, lies about $2\frac{1}{2}$ miles north-westward of Petrovac, and the village of Sveti Stefan is situated on a small rocky peninsula about a mile further north-north-westward. Hrid Golubinjin, which is bare and steep-to, lies about 3 cables south-south-eastward of Sveti Stefan and 2 cables offshore. Between Rt

Charts 1440, 2158a, 2158b.

Chart 1463.

Dubovica and Sveti Stefan, houses and cultivation may be seen ; the higher ground being covered with trees.

Chart 1463, with plan of Budva harbour.

- 5 Uvala Mala luka is entered between Sveti Stefan and the southern extremity of Otočić Sveti Nikola, about $1\frac{1}{2}$ miles west-north-westward.

- Otočić Sveti Nikola is 397 feet (121^m0) high and is connected, at its northern end, to the mainland by two ridges. One ridge extends in
10 a north-north-easterly direction and is very shallow, rocky and narrow, and forms a natural breakwater ; there is no passage for boats over it, except in fine weather. Between the northern extremity of this ridge and the mainland, close northward, there is a depth of 19 feet (5^m8) ; this passage is marked by a beacon on each side. The other ridge
15 extends in a north-westerly direction and joins the shallow coastal bank off the town of Budva.

- There is a chapel on the northern end of the islet ; the south-western side of the islet is cliffy and is fringed by a shallow bank, about a cable wide on which there are some above-water and sunken rocks. A rock,
20 with a depth of less than 6 feet (1^m8) over it, lies detached, about a quarter of a mile west-north-westward of the southern extremity of the islet and $1\frac{1}{2}$ cables offshore, and two detached patches, with depths of less than 3 fathoms (5^m5) over them, lie about half a cable and $1\frac{1}{2}$ cables, respectively, north-westward of this rock.

- 25 Rt Zavala, with a ruined fort above it, is the southern extremity of a projection extending from the head of Uvala Mala luka. Zavala bay is situated between this projection and the shallow ridge extending north-north-eastward from Otočić Sveti Nikola. Depths of less than 6 fathoms (11^m0) extend about a quarter of a mile eastward from the
30 northern extremity of Otočić Sveti Nikola and from the shoalest part of the ridge forming the western side of this bay. A detached shoal, with a depth of 8 feet (2^m4) over it, lies 2 cables eastward of the chapel on the northern end of the islet.

- Light.**—A light is exhibited, at an elevation of 75 feet (22^m9), from
35 a lantern on the south-eastern corner of a dwelling, 10 feet (3^m0) in height, on the south-eastern extremity of Otočić Sveti Nikola (*Lat.* $42^\circ 16' N.$, *Long.* $18^\circ 52' E.$).

Chart 1463, plan of Bar Roads.

- Anchorage.**—There is anchorage for small vessels in Uvala Spič,
40 with offshore winds, in a depth of 9 fathoms (16^m5), sand, midway between Rt Rotac and the village of Sutomore, but with onshore winds it is completely exposed.

Chart 1463.

- Anchorage can be obtained north-westward of Otočić Sveta Nedelja,
45 with Petrovac bearing 040° , distant a quarter of a mile.

Small vessels, with local knowledge, can find shelter in the small bights on each side of Sveti Stefan, over a bottom of sand and weed, good holding ground. There is a small quay on the northern side of the peninsula.

- 50 Uvala Mala luka affords clear anchorage in depths of from 9 to 16 fathoms (16^m5 to 29^m3), good holding ground. During summer, large vessels may anchor here, but it is exposed to southerly winds.

Chart 1463, plan of Budva harbour.

During strong south-easterly winds, better shelter will be found

Charts 2701, 1440, 2158a, 2158b.

To face page 179.

Fort Kosmač.

Mt. Lovćen.



Rt
Platanon.

Uvala Trsteno. Zlati
Jaz.

Mt. Spas.

Budva,
bearing 349°,
3 miles.

Oločić
Sveti Nikola.

Rt Zavala
Lt. Ho.

Sv. Stefan.

Budva and coast adjoining.

(Original dated 1910.)

Chart 1463, plan of Budva harbour.

at a distance of 2 cables from the north-eastern side of Otočić Sveti Nikola, with the northern end of that islet, bearing 280° , distant 4 cables, in a depth of 9 fathoms, mud.

During a Bora, or strong north-easterly winds, there is good anchorage in Zavala bay, at a distance of 2 cables west-north-westward of Rt Zavala, in a depth of 7 fathoms (12^m8).

Luka Budva.—This harbour is situated between the mainland and the two ridges extending from the northern end of Otočić Sveti Nikola, previously described. The town of Budva is situated on a small promontory on the south-western side of the harbour; it is surrounded by a wall and has a church with a conspicuous belfry. A small mole projects northward and eastward from the north-eastern extremity of the promontory and another small mole extends in a south-easterly direction from the western side of the harbour, about half a cable northward of the town. The channel into the harbour is over the ridge between the islet and the town; there is a boat channel, with a depth of about 2 feet (0^m6) in the fairway, over the ridge on the eastern side of the harbour, with Budva church bearing 290° . See view facing this page.

Buoys.—Light.—A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 17 feet (5^m2) in height, on the head of the eastern mole at Budva (*Lat. $42^\circ 17' N.$, Long. $18^\circ 51' E.$*).

A white conical buoy, surmounted by a ball, lies, in a depth of about 2 fathoms (3^m7), on the ridge between Otočić Sveti Nikola and the town. A vessel should pass close south-eastward of this buoy, but no greater depth than 12 feet (3^m7) can be depended on over this ridge. Southerly and south-westerly winds cause a heavy sea across the ridge.

There is a mooring buoy about $1\frac{1}{4}$ cables east-north-eastward of the eastern mole.

Berthing.—Small craft can berth alongside the quay on the northern side of the town, where there are depths of about 6 feet (1^m8).

Anchorage.—There is anchorage in Luka Budva, in depths of from $3\frac{1}{4}$ to $5\frac{1}{4}$ fathoms (5^m9 to 10^m1), sand, rock, mud and weed, off the town, sheltered by the two ridges and by Otočić Sveti Nikola.

Coast.—Rt Mogren, the south-eastern termination of Mount Spas, lies about 6 cables south-westward of the light-structure at Luka Budva. Mount Spas, 1,276 feet (388^m9) high, stands about half a mile north-westward of Rt Mogren; this mountain is pyramidal, the north-western being the steepest side, and, from a distance, appears like an island.

Chart 1463.

Zaliv Jaz is entered between Rt Mogren and Rt Jaz (Trsteno), about a mile westward. This bay affords shelter in moderate weather with easterly and north-easterly winds, and may serve as an anchorage in a Bora, or in north-westerly winds; but as it is open southward, a vessel should leave at once on any indication of wind from that quarter. The shore of the bay is bordered by a shallow bank, which is as much as 2 cables wide on its north-western side. On the north-eastern side of the bay, an above-water rock lies on the shore bank about a cable offshore. In a Bora, vessels may anchor near the north-eastern shore, under Mount Spas, with shore fasts; here they would be tolerably sheltered.

Uvala Trsteno is entered between Rt Jaz and Rt Platamon, about

Charts 2701, 1440, 2158a, 2158b.

Chart 1463.

1½ miles west-south-westward. The inner part of this bay is fairly well sheltered from northerly winds; south-easterly winds cause a heavy sea.

- 5 From Rt Platamon, the coast trends 4½ miles north-westward to Rt Žukovac, which is high and abrupt; if overtaken by a Bora between these points, the best anchorage is close inshore, off a conical hill, 1,007 feet (306^m9) high, on the summit of which stands Sveti Ilija chapel, which has a belfry; but on the cessation of the Bora or the
10 slightest indication of a southerly wind, which is often preceded by a heavy swell, a vessel should at once get under way. Steep well-wooded hills rise between the two points and the coast is everywhere steep-to.

From Rt Žukovac, the coast trends about a mile northward and 1½
15 miles north-westward to Rt Traste (*Lat. 42° 21' N., Long. 18° 41' E.*).

Danger.—Greiben Kamenik (Albaneze), nearly awash and almost steep-to, lies 4 cables north-westward of Rt Žukovac.

- Zaliv Traste.**—**Danger.**—This bay is entered between the point of the same name and Rt Kočište, 1½ miles west-north-westward. It
20 may be readily identified, its head being the low isthmus connecting the hilly peninsula, forming the southern sides of Tivatski zaliv and Kumborski kanal, with the land south-eastward of it, rising from Rt Traste to a height of 1,345 feet (410^m0) at Mount Prčja Glava (Prčija), about 2½ miles east-south-eastward of the point.

- 25 A shallow bank extends about 2 cables off Rt Traste.

A detached, rocky shoal, with a depth of 7 fathoms (12^m8) over it, lies about half a mile east-north-eastward of Rt Kočište.

- The bay is open southward, but Uvalica Bigova, situated in the south-eastern corner, is sheltered from the Bora, southerly, and south-
30 westerly winds; the village of Bigova (Traste) and Sveti Nikola church are situated at the head of this cove. There are several forts on the hills around the bay.

Anchorage.—Vessels sometimes seek temporary anchorage in Zaliv Traste, over a bottom of sand and shells.

- 35 There is good anchorage in Uvalica Bigova, in a depth of 8 or 9 fathoms (14^m6 or 16^m5). Small vessels can anchor off the head of this cove in depths of from 3½ to 5½ fathoms (5^m9 t. 10^m1), sand and weed, good holding ground; in a Bora, they secure to the shore.

- Coast.**—From Rt Kočište, the coast, which is indented, trends
40 about 2 miles westward and 2½ miles north-westward to Rt Mirište (Arca), the eastern entrance point of Boka Kotorska.

- Dobra luka, entered between Rt Kočište and Rt Kupa, about a mile westward, is sheltered to some extent from north-westerly winds and the Bora. The best anchorage is in the north-eastern part, where
45 the bottom is sand covered with weed, good holding ground.

Charts 1463, 2713, 2701.

- Submarine exercise area.**—There is an extensive submarine exercise area, indicated on the charts by pecked lines, off this part of the coast; its north-eastern limit lies about 3½ miles south-westward
50 of Rt Mirište. See page 45.

Chart 1463.

BOKA KOTORSKA.—**General description.**—**Aspect.**—Boka Kotorska, formerly Gulf of Kotor, affords excellent anchorage, but for

Charts 2701, 1440, 2158a, 2158b.

To face page 181.

Mt. Kobilu.

Mt. Dobroslava.

Mt. Radostak.



Ogri
ri.

Ri
Kobila.

Hercognovi. Ri
Laštica,
bearing 000°, 3½ miles.

Ološč
Lassavica.

Ri Mirilla.

Boka Kotorska.

(Original dated 1910.)

Chart 1463.

a sailing vessel it is often difficult and even dangerous of access and exit from October to January. The gulf consists of three separate basins, connected by narrow channels. The town of Kotor lies at the south-eastern end of the north-eastern basin.

These basins being surrounded by high land, great caution is necessary in selecting a berth for anchoring, owing to the suddenness and violence of the squalls from the valleys on the northern and eastern sides; but, not including the entrance, the basins may be considered to afford good anchorages with sufficient depths for large numbers of vessels of the deepest draught.

Near the centre of the basins, the bottom is generally mud; nearer the shores, mud, sand and shells.

On sighting the land, Radostak, a mountain, 4,744 feet (1446^m0) high, situated about 6 miles northward of Rt Mirište, and Lovćen, a mountain, 5,770 feet (1758^m7) high, about 11 miles eastward of the same point, may be seen a great distance in clear weather; but during south-easterly or south-westerly winds, they are not generally visible until sufficiently near for the lower land to be seen. Lovćen (*Lat.* 42° 24' N., *Long.* 18° 49' E.) is saddle-shaped and is conspicuous when approaching the coast from any quarter. See view on charts 1463 and 2713.

Oštri rt, the western entrance point, about 1½ miles westward of Rt Mirište, with the signal station on its summit; a fort on Otočić Lastavica, 50 feet (15^m2) high, situated in the entrance; and a small round fort on Rt Mirište, close off the northern side of which there is a rock with some ruins on it, situated on the eastern side of the entrance, are conspicuous. See view facing this page.

There are numerous villages and detached houses on either side and the low land, extending to the base of the mountains is cultivated.

Winds.—Currents.—The land wind in Boka Kotorska often lasts until late, so that, on nearing Oštri rt, a vessel may lose even a fresh south-easterly breeze; it is not prudent for a sailing vessel to close the land before 1000 or after 1500. It is always necessary to be prepared for the Bora, which may come on suddenly with extreme violence. In winter, it is always difficult to distinguish the land about the entrance in south-easterly, southerly or south-westerly winds; indeed, in a vessel under sail, it is then sometimes impracticable to enter. See page 15.

The currents are rapid and uncertain in the channels, especially in the entrance. After heavy rains, they attain rates of from 2 to more than 3 knots, and at other times about half these rates. In summer there is little current.

Entrance.—Lights.—Signal station.—The shores of the entrance to Boka Kotorska are inaccessible, rocky, and covered with brushwood; as it is so exposed to winds and heavy seas from southward, it is not prudent to anchor in the entrance unless forced to do so by a calm and the strength of the current. Luka Žanjica, about half a mile northward of Rt Mirište, affords anchorage over a bottom of sand, with good holding ground, but it is exposed to north-westerly and south-westerly winds.

A light is exhibited, at an elevation of 236 feet (71^m9), from a red iron pyramidal framework structure, 34 feet (10^m4) in height, on Oštri rt.

Charts 2713, 2701, 1440, 2158a, 2158b.

Chart 1463.

A light is exhibited, at an elevation of 113 feet (34^m4), from a red stone tower, 14 feet (4^m3) in height, situated in the fort, on Otočić Lastavica.

- 5 A signal station, consisting of a tower, painted in black and white bands, and a flagstaff, is situated on the summit of Oštri rt.

A sailing vessel should not enter, or attempt any of the passages within Boka Kotorska, without the prospect of carrying a good steady breeze through.

- 10 Between Rt Kobila, situated about 2 miles northward of Oštri rt, and Rt Luštica, about a mile south-eastward, the south-going and north-going currents meet, and, with southerly winds, there is often a heavy sea.

Radio station.—There is a radio station at Klinci, about three-quarters of a mile north-eastward of Rt Luštica. See page 46.

Charts 419, 1463.

- Telegraph cables.**—Several telegraph cables, indicated on the charts are laid across the entrance channel, and also across Hercegnovski (Topla) zaliv, the western basin. A cable is also laid about 20 4 cables off the western shore of the entrance channel towards the north-western end of that bay.

Submarine mining ground.—There is a submarine mining ground, indicated on the charts by pecked lines, which extends from the southern end of the entrance channel to the northern shore of Hercegnovski 25 zaliv, in the vicinity of the town of Hercegnovi (Ercegnovi), situated about 3½ miles northward of Oštri rt (*Lat. 42° 24' N., Long. 18° 32' E.*).

- Prohibited anchorages.**—Anchoring and ground fishing is prohibited in the submarine mining area, except in Luka Rose and at Hercegnovi, and in addition, for sailing vessels, opposite Njivice, 30 situated about 1½ miles south-westward of Hercegnovi. Anchorage is also prohibited in the following areas, as indicated on the charts by pecked lines :

(b) Kumborski kanal.

(c) The heads of Krtolski zaliv and Uvala Kukuljina.

- 35 (d) Off the naval establishment at Tivat, except under stress of weather, permission of the naval authorities is necessary. The limits of this area are not indicated on the charts.

(e) Tesnac Verige.

- 40 (f) In Kotorski zaliv, the north-eastern basin, between the northern end of Tesnac Verige and the vicinity of the village of Perast.

(g) In the vicinity of any telegraph cable.

Regulations.—A vessel must not clean or stoke fires, nor use forced draught within a radius of 2½ cables of the following positions :

(1) Rt Mirište.

- 45 Military positions at

(2) Pristan, on the southern side of Kumborski kanal.

(3) Petrovići, on the southern side of Tivatski zaliv.

- (4) Between Rt Opatovo and Lastva, about three-quarters of a mile southward, on the eastern side of the southern approach to Tesnac 50 Verige.

(5) Northward of Lepetane, on the eastern side of Tesnac Verige.

Vessels are prohibited from passing within 1½ cables of positions (1) to (4), and a vessel passing position (5) should keep as near as possible, consistent with safe navigation, to the opposite side of the channel.

Charts 2713, 2701, 1440, 2158a, 2158b.

Charts 419, plan of Meljine bay and Kumbur channel, 1463.

Hercegnovski zaliv.—General description.—This bay is entered from the northern end of the entrance channel to Boka Kotorska, between Rt Kobila and Rt Kabala, about three-quarters of a mile east-south-eastward. It includes the harbours of Hercegnovi, Meljine and Zelenika. The sides of the bay consist of high land, the upper parts of which are barren and of whitish aspect. The south-western and south-eastern sides consist of moderately steep slopes mostly covered with bushes; the northern shore rises gradually to Mount Radostak and Mount Dobrostatica, 5,150 feet (1569^m7) high, about 1½ miles west-north-westward; the foot of these mountains and the hilly land by the coast are covered with trees and cultivation. 5 10

Luka Rose (Roze) is situated on the south-eastern side of Hercegnovski zaliv, close south-westward of a small projection about half a mile north-eastward of Rt Kabala. It is well known, locally, as the first place of shelter from southerly winds. 15

At the head of Hercegnovski zaliv, which is bordered by a shallow bank about half a mile wide, there are the remains of salterns and extensive marshes, through which the Sutorina river flows towards the sea. 20

Hercegnovi, a small town, with a population of about 1,500, in 1931, is situated on the northern side of the bay; the land in the vicinity is cultivated.

The harbour at Hercegnovi is small and is protected by two moles. Local steamers can lie along the northern side of the southern mole. There are depths of about 17 feet (5^m2) at the outer end of this mole and 10 feet (3^m0) at its inner end. 25

The coast between Hercegnovi and the village of Meljine, at the head of a bay, about 1½ miles east-north-eastward, is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as 2 cables wide in places. Karatoč, a dark, jagged above-water rock, lies on the end of a shallow spit, about 1½ cables south-eastward of the southern molehead at Hercegnovi and a cable offshore. Savina, an above-water rock, lies close offshore, about a quarter of a mile south-south-westward of the light-structure on the lazaretto at Meljine. 30 35

The hotel at Meljine, a large castellated building, and Trojica church, about 6 cables east-north-eastward, are conspicuous when approaching the anchorage.

The harbour of Meljine, where there is a lazaretto, is situated about 1½ cables westward of Meljine. There is a small breakwater close southward of the lazaretto and two small moles for the use of boats at Umac, on the eastern side of the bay, about half a mile east-south-eastward of the lazaretto. There are depths of 10 feet (3^m0) at the head and along the eastern part of the northern side of the breakwater. 40

A quay has been constructed a short distance north-westward of Zelenika, situated about half a mile south-eastward of Umac. The quay has a depth of 3½ fathoms (6^m4) alongside; the coastal bank close south-eastward of this quay was reported, in 1939, to be extending. 45

Lights.—A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 15 feet (4^m6) in height, on the head of the southern mole at Hercegnovi (*Lat.* 42° 27' N., *Long.* 18° 32' E.). 50

A light is exhibited, at an elevation of 30 feet (9^m1), from an iron structure, 25 feet (7^m6) in height, on a wall of the lazaretto at Meljine.

A light is exhibited, at an elevation of 30 feet (9^m1) from an iron

Charts 419, plan of Meljine bay and Kumbur channel, 1463.

structure on a concrete hut, 27 feet (8^m2) in height, on the quay at Zelenika (Lat. 42° 27' N., Long. 18° 34' E.).

Anchoragees.—Vessels, with local knowledge, frequently anchor in 5 Luka Rose, where there is a depth of 6 fathoms (11^m0), mud. It is a convenient position for a putting to sea with the land breeze.

There is a mooring buoy in the harbour.

Hercegnovski zaliv affords anchorage in its north-western part, in a depth of 6 or 7 fathoms (11^m0 or 12^m8), mud, about 7 cables off 10 the head of the bay and 6 cables from the mole at Hercegnovi. It is greatly exposed to winds from seaward, and is not a good anchorage even in the fine season.

The coast between Hercegnovi and the lazaretto at Meljine is exposed to winds from seaward and the anchorage off it is not good. There are 15 mooring buoys off the lazaretto.

The best anchorage in the western basin is in the bay off Meljine, in a depth of 11 or 12 fathoms (20^m1 or 21^m9), mud, about 3½ cables south-eastward of the lazaretto; as the depths decrease rapidly towards the shore, and the holding ground is good, there is no risk of 20 being driven ashore although southerly and south-easterly winds raise a considerable sea. This anchorage is safe during south-easterly, north-westerly or westerly winds; the last seldom blow longer than 24 hours.

There is good anchorage on the eastern side of Hercegnovski zaliv, 25 between the village of Zelenika and the village of Kumbor, about three-quarters of a mile south-eastward, but, in a Bora, shore fasts should be laid out north-eastward, on account of the steepness of the bottom, which renders the anchor liable to drag.

See Prohibited anchorages, page 182.

30 **Kumborski kanal.**—Kumborski (Kumbur) kanal connects Hercegnovski zaliv with Tivatski zaliv, east-south-eastward; it is about 4 cables wide in its narrowest part. The northern shore, from the light-structure at Zelenika to Rt Đenovići (Gjenović), about 1½ miles south-eastward, is fringed by a bank with depths of less than 5 fathoms 35 (9^m1) over it, about half a cable wide. From a point, about 1½ cables further eastward, the coastal bank extends as much as 1½ cables offshore; a breakwater extends about 1½ cables east-south-eastward from this point.

The village of Kumbor (Kumbur), off which a jetty, with a depth of 40 13 feet (4^m0) at its head, projects a short distance westward, is situated on the north-eastern side of the channel, about a mile south-eastward of the light-structure at Zelenika, and the village of Đenovići lies about 1½ cables north-eastward of the outer end of the breakwater just mentioned. The harbour at Đenovići, which is shallow, lies northward 45 of the breakwater; on the southern side of the head of this breakwater, there is a quay, 115 feet (35^m0) long, with a depth of 13 feet (4^m0) alongside.

There are a number of mooring buoys moored a short distance off this side of the channel and two are moored about 1½ cables offshore 50 abreast Kumbor. Mooring buoys are moored a short distance offshore in the vicinity of Pristan, situated 4 cables south-south-eastward of the light-structure on the breakwater at Đenovići. There is a small quay at Pristan with a depth of 13 feet (4^m0) alongside.

Light.—A light is exhibited, at an elevation of 45 feet (13^m7), from

Charts 2713, 1440, 2158a, 2158b.

Charts 419, plan of Meljine bay and Kumbur channel, 1463.

a grey iron framework tripod, 15 feet (4^m6) in height on the breakwater head at Đenovići (Lat. 42° 26' N., Long. 18° 36' E.).

Current.—A constant west-going current flows through Kumborski kanal.

Regulations.—A steam vessel passing through Kumborski kanal must pass more than 210 yards (192^m0) southward of Đenovići breakwater light-structure, or more than 330 yards (301^m7) from the coast at Pristan, on the southern side of the channel and reduce her speed to 6 knots.

Fuel.—There is a coal store about 2 cables north-westward of Kumbor. Foreign vessels are only supplied in case of necessity.

There is also a coaling station at Špilica, on the southern side of the channel.

Charts 419, plan of Tivat bay, 1463.

Tivatski zaliv.—**Quays.**—**Buoy.**—Tivatski (Tivat) zaliv is the central basin in Boka Kotorska. Krtolski zaliv and Uvala Kukuljina lie at the south-eastern end of this bay, and the government dockyard is situated in the bay close southward of Rt Seljanovo, on its north-eastern side. Tivatski zaliv is landlocked and well sheltered from the Bora in its eastern part; the bottom consists generally of mud.

In winter it is difficult, if not impossible, of access to a sailing vessel on account of southerly winds, and the strength of the current, which makes it useless to attempt to beat through Kumborski kanal. Westerly winds are of little avail, as they seldom attain any strength.

The land on the south-western side is high, and almost the only dwellings on that side are at the entrance to Krtolski zaliv. On the north-western side near the shore, the land is low, cultivated, and studded with houses under the shelter of Mount Devesile, 2,546 feet (776^m0) high, 1½ miles inland. There are quays along this shore, where small vessels, with local knowledge, can berth; at Crnogorčević, at Podbaošići (Baošić), on the western side of Rt Pijavica, and at Bijela, situated half a mile, 1½, 2½, and 3 miles, respectively, east-north-eastward of the light-structure at Đenovići.

In 1942, there were depths of 22 feet (6^m7) alongside the quay at Rt Pijavica.

The north-eastern side of Tivatski zaliv is similar to the north-western, and is sheltered by the high lands of Mount Vrmac, 2,510 feet (765^m0) high, about 3 miles eastward of Rt Pijavica. At Donja Lastva, situated about 1½ miles eastward of Rt Pijavica, there is a quay, with a depth of 11 feet (3^m4) alongside.

Krtolski (Krtole) zaliv is entered between the light-structure at Bjelila (Bjelica), situated about 3 miles east-south-eastward of Pristan, and Otok Milosrde, 6 cables east-north-eastward. The islands of Milosrde, Maslinik (Sveti Marko) and Sveti Trojica (Prevlaka), which lie on a reef extending about 1½ miles west-north-westward from a point on the mainland, situated 1½ miles eastward of Bjelila light-structure, form the northern side of Krtolski zaliv. Otok Milosrde, the smallest, has a church with a high belfry on it; Maslinik, the largest and middle island, is covered with bushes and has some beacons on its western end; and Sveti Trojica has a chapel on it. There is an extensive mud-bank at the head of Krtolski zaliv.

Pličina Jezičac (Tonjola), nearly awash in places, extends about 5½ cables from the north-western end of Otok Maslinik. The light

Chart 419, plan of Tivat bay, 1463.

at Bjelila is obscured over this reef between the bearings of 216° and 245°.

Uvala Kukuljina is entered between the north-western extremity of 5 Pličina Jezičac and Stanišić quay, situated a short distance southward of the dockyard at Tivat, about 1½ miles north-eastward. The eastern and north-eastern sides of this bay are fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as 3 cables wide in places. A shoal, with a least depth of 3 feet (0^m9) over it, lies about 3 cables 10 south-south-eastward of Stanišić quay and one cable offshore.

Lights.—**Light-buoys.**—**Beacons.**—A light is exhibited, at an elevation of 16 feet (4^m9), from a grey iron tripod, 14 feet (4^m3) in height, on the quay at Podbaošići. The position of this light is shown approximately on chart 1463.

15 A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m7) in height, on the quay at Bijela, situated about three-quarters of a mile south-westward of Rt Sveta Nedelja, the south-western entrance point of Tesnac Verige (*Lat.* 42° 28' N., *Long.* 18° 41' E.).

20 A light is exhibited, at an elevation of 18 feet (5^m5), from a grey iron column, on the coast close northward of Bjelila.

Two light-buoys, each painted red and exhibiting a *white flashing* light, are moored about one and 2½ miles, respectively, eastward of the light-structure on Đenovići breakwater.

25 A concrete beacon, 6 feet (1^m8) high, surmounted by a ball, stands on the north-western end of Pličina Jezičac.

The 3-foot (0^m9) shoal, 3 cables south-south-eastward of Stanišić quay is marked by a beacon surmounted by a ball.

Anchorage.—There is anchorage anywhere off the north-western 30 shore of Tivatski zaliv, but this anchorage is exposed to the Bora and Scirocco.

The best anchorage for vessels of moderate size, in south-easterly or north-westerly winds, and even in the Bora, as, owing to its distance from the high land, the heavy squalls from the valleys are comparatively 35 little felt, is in Krtolski zaliv, in depths of from 6 to 10 fathoms (11^m0 to 18^m3).

Good anchorage may be obtained in Uvala Kukuljina, north-eastward of the islands forming its south-western side, in depths of from 8 to 10 fathoms (14^m6 to 18^m3), mud; in south-easterly winds the water is 40 quite smooth, and with winds from the opposite quarter, the inclination of the bottom is favourable for holding on.

See Prohibited anchorages, page 182.

Submarine exercise area.—There is a submarine exercise area in Tivatski zaliv, the limit of which is indicated on chart 1463 by a 45 pecked line. See page 45.

Torpedo range.—**Beacons.**—There is a torpedo range, about 3½ miles long, in Tivatski zaliv between Pristan and Ramadanović, about half a mile south-eastward of the light-column on Stanišić quay.

50 The western end of the range is marked by two pairs of white pillars, and the eastern end by one pair of white pillars. The range is divided into six sections, each one kilometre long, which are indicated by pairs of white pillars erected on the south-western side of the bay, the easternmost pair being situated near the western end of Otok Maslinik.

Charts 2713, 1440, 2158a, 2158b.

Chart 419, plan of Tivat bay.

Tivat.—Dockyard.—A dockyard is situated on the north-eastern side of Tivatski zaliv, between Stanišić quay and Rt Seljanovo about three-quarters of a mile north-westward; the latter point is covered by the *red* sector of the light on the head of the stone pier at Tivat, between bearings of from 140° to 167° . A short mole projects from the vicinity of the Officers' club, about 3 cables eastward of Rt Seljanovo; another short mole projects from the vicinity of Verona, about a cable farther south-eastward. 5

About half a mile east-south-eastward of Rt Seljanovo, a mole projects about a cable west-south-westward and then $1\frac{1}{2}$ cables south-south-eastward, forming with another mole, a short distance southward, projecting towards its head, a small harbour, with depths of about 3 fathoms (5^m5) in its western part, where the depths are greatest. 10

A short distance southward of this harbour, there is a small basin, in which the depths are about $1\frac{1}{2}$ fathoms (3^m2). 15

About half a cable further southward, a stone pier with a light railway along it, projects $1\frac{1}{2}$ cables west-south-westward, and has a depth of 24 feet (7^m3) alongside its outer end. Stanišić quay is situated about $1\frac{1}{2}$ cables south-eastward of the root of this pier. 20

There are several mooring buoys off the dockyard. Large vessels, not securing to the buoys, can anchor outside them in depths of from 13 to 14 fathoms (23^m8 to 25^m6), mud.

The Health office is situated on Stanišić quay.

The town of Tivat, containing about 2,500 inhabitants, in 1931, lies about half a mile eastward of the dockyard. 25

Lights.—Beacon.—A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 14 feet (4^m3) in height, on the mole near the Officers' club.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 15 feet (4^m6) in height, on the mole at Verona. 30

A light is exhibited, at an elevation of 24 feet (7^m3) from an iron column, 19 feet (5^m8) in height, on the north-western side of the entrance to the harbour.

Two lights, disposed vertically, are exhibited at elevations of 23 and 17 feet (7^m0 and 5^m2), respectively, from an iron column, 18 feet (5^m5) in height, on the molehead on the south-eastern side of the entrance to the harbour. 35

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron pyramidal structure, 16 feet (4^m9) in height, on the head of the stone pier, southward of the harbour (*Lat.* $42^{\circ} 26' N.$, *Long.* $18^{\circ} 42' E.$). 40

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 16 feet (4^m9) in height, on the north-western corner of Stanišić quay.

A beacon stands close eastward of Rt Seljanovo. 45

Port facilities.—Two floating docks are moored off the western side of the mole on the western side of the harbour. For details of the larger, see Appendix I, page 601.

There is a travelling crane, capable of lifting 50 tons. Repairs can be undertaken. 50

A tug is available.

There is a Government coal depot where a large quantity is kept in stock.

Water is laid on to the quays.

Charts 1463, 2713, 1440, 2158a, 2158b.

Chart 419, plan of Verige channel.

Tesnac Verige.—**Lights.**—This channel, leading from Tivatski zaliv into the north-eastern basin, is entered between Rt Sveta Nedelja, situated about a mile north-eastward of Rt Pijavica, and
 5 Rt Opatovo, on the north-eastern side of Tivatski zaliv, about 2 cables east-south-eastward. The channel is about $1\frac{1}{2}$ cables wide in its narrowest part, where it enters the north-eastern basin between Turski rt, about $1\frac{1}{2}$ miles north-north-eastward of Rt Sveta Nedelja, and Rt Gospa east-south-eastward. The bottom consists of mud and
 10 there are no dangers outside a distance of 50 yards (45^m7) from either side.

When entering the north-eastern basin, two currents—one from Kotorski zaliv and the other from Risanski zaliv—at times cause a race, which requires a 3-knot breeze for a sailing vessel to pass
 15 through.

See Prohibited anchorages, page 182.

A light is exhibited, at an elevation of 24 feet (7^m3), from a white conical iron tower, 22 feet (6^m7) in height, on Rt Sveta Nedelja (*Lat.* $42^\circ 28' N.$, *Long.* $18^\circ 41' E.$).

20 A light is exhibited, at an elevation of 17 feet (5^m2), from a grey iron column, 13 feet (4^m0) in height, on Rt Opatovo.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 15 feet (4^m6) in height, on the head of the mole at the village of Kamenari, about 4 cables northward of Rt Sveta Nedelja.

25 A light is exhibited, at an elevation of 28 feet (8^m5), from a white conical iron tower, 26 feet (7^m9) in height, on Turski rt.

Chart 1463.

North-eastern basin.—This basin consists of two parts, a north-western and a south-eastern; Risanski (Risan) zaliv lies at the northern
 30 end, and Morinjski (Morinj) zaliv at the western end, of the north-western part and Kotorski zaliv forms the south-eastern part.

Although there is good holding ground in nearly every part of the basin, in depths of from 10 to 20 fathoms (18^m3 to 36^m6), it is not often resorted to by sailing vessels owing to the difficulty of access, but a
 35 considerable number of local vessels winter in it.

The land squalls are heavier here than in the other basins, the high land rising abruptly from near the coast. The south-easterly wind is also dangerous, particularly under the northern shore, which it reaches in violent sudden gusts. Northerly winds, though squally, never
 40 blow here in great strength.

Chart 419, plan of Verige channel.

North-western part of the north-eastern basin.—**Islets.**—The western slopes of Mount Kason, 2,880 feet (877^m8) high, about three-quarters of a mile inland, form the eastern side of this portion of the
 45 north-eastern basin; its southern and north-western sides also rise steeply to a considerable elevation. A bank, with depths of less than 6 fathoms (11^m0) over it, extends about 2 cables off the head of Risanski zaliv and off the village of Risan, situated on the eastern side of the head of the bay.

50 The land in the neighbourhood of Risan and also that along the southern shore is cultivated, but the north-western shore is sterile and almost uninhabited.

Two islets, each with a chapel on it, lie in the approach to Risan; Sveti Đorđe (Juraj), the south-eastern, lies about half a mile north-

Charts 1463, 1440, 2158a, 2158b.

Chart 419, plan of Verige channel.

north-eastward of Turski rt and 2 cables off the north-eastern shore ; Sveta Marija (Gospe od Škrpjela), the north-western islet, lies about half a cable north-westward of Sveti Đorđe. These islets are connected by a bank, with depths of less than 5 fathoms (9^m1) over it, and each is surrounded by a narrow, shallow bank ; there is a passage on either side of the bank on which they lie, that on the south-western side being the wider.

Charts 419, plan of Verige channel, 1463.

The village of Perast, where there are two quays with shallow banks extending a short distance off them, lies about 7 cables north-eastward of Turski rt. Vessels drawing 13 feet (4^m0) can berth alongside the main quay at Perast.

The village of Morinj lies at the head of Morinjski zaliv, on the northern side of the mouth of a stream which flows eastward through a valley. There are jetties at both Morinj and the village of Lipci, about half a mile north-eastward, where small vessels, with local knowledge can berth.

The small harbour of Risan, in which there are depths of from 9 to 13 feet (2^m7 to 4^m0), is formed by a hook-shaped breakwater extending from the village.

Lights.—**Buoy.**—A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 14 feet (4^m3) in height, on the principal quay at Perast (*Lat. 42° 29' N., Long. 18° 42' E.*).

A light is exhibited, at an elevation of 12 feet (3^m7), from an iron column, 11 feet (3^m4) in height, on the eastern corner of the landing place at Morinj.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 16 feet (4^m9) in height, on the head of the breakwater at Risan.

A buoy is moored at the edge of the shore bank off the breakwater at Risan.

Chart 1463.

Anchorage.—Morinjski zaliv affords indifferent anchorage ; the Bora blows into it with extremely heavy gusts.

Large vessels can anchor off Risan in a depth of 7 fathoms (12^m8), mud, or in greater depths as convenient. This is the best anchorage in this portion of the basin.

Steamers, with local knowledge, can secure to the inner side of the breakwater at Risan.

See Prohibited anchorages, page 182.

Charts 419, plan of Kotor harbour, 1463.

Kotorski zaliv.—The northern and eastern sides of this portion of the north-eastern basin are bounded by steep, and in many places, nearly perpendicular, rock walls, at the foot of which there is a narrow strip of land on which there are numerous villages and groups of houses surrounded by cultivation. The houses at Dražen Vrt (Drazinwert), on the northern side, about 1½ miles eastward of Perast, and the church at Sveti Stasije, on the eastern side, about 1½ miles further south-eastward, are conspicuous.

The south-western side is partly built on and cultivated and partly overgrown with bushes on the slopes of Mount Vrmac. The village and church of Stoliv, the upper of two villages of the same name, surrounded by gardens, lie on the slope about 1½ miles north-north-westward of the summit of that mountain, and are conspicuous ; the lower

Charts 1463, 2713, 1440, 2158a, 2158b.

Charts 419, plan of Kotor harbour, 1463.

village of Stoliv is situated on the coast about 3 cables further north-north-westward. The village of Prčanj, at the eastern foot of Mount Vrmac, is surrounded by gardens; a conspicuous church stands, on the 5 slope of the hill, about a quarter of a mile south-westward of this village.

The town of Kotor lies at the south-eastern end of Kotorski zaliv, about $1\frac{1}{2}$ miles south-south-eastward of Prčanj. The south-western side of the town is fronted by a quay, about 3 cables long, the north- 10 western portion of which projects and forms the southern side of the mouth of an inlet, which extends along the northern side of the town and is crossed by two bridges.

The sides of the basin, in the approach to Kotor, are fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, which is 15 narrow on the western side and about three-quarters of a cable wide, in places, on the eastern side and at the head of the harbour.

The mouth of a river lies about a cable northward of the extremity of the quay at Kotor.

The villages in this approach have small moles and basins for small 20 craft.

Sveti Matija church, on the eastern side, about half a mile south-eastward of Prčanj, and Sveti Ilija church, on a point, about 4 cables further southward, are conspicuous.

Telegraph cable.—A cable crosses the north-eastern basin from 25 the eastern part of Perast to Andrići, on the south-western shore, about 6 cables south-south-westward. The positions where the cable is landed are marked by small white pyramidal stone towers.

Lights.—A light is exhibited, at an elevation of 20 feet (6^m1), from an iron pyramidal structure, 19 feet (5^m8) in height, at Sveti 30 Stasije (*Lat.* $42^\circ 28' N.$, *Long.* $18^\circ 46' E.$).

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m6) in height, on the molehead at the lower village of Stoliv.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron 35 pyramid, 17 feet (5^m2) in height, on Rt Rdakovo (Zbutega), near the southern end of Prčanj.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron pyramid, 15 feet (4^m6) in height, situated about half a mile north-north-westward of Prčanj.

40 A light is exhibited, at an elevation of 15 feet (4^m9), from an iron column, 14 feet (4^m3) in height, on the quay about half a cable south-westward of Sveti Matija church.

A light is exhibited, at an elevation of 14 feet (4^m3), from an iron framework structure, 12 feet (3^m7) in height, on the molehead about 45 a quarter of a mile northward of the village of Muo, situated on the western shore, about 3 cables south-westward of Sveti Ilija church.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m6) in height, on the north-western extremity of the quay at Kotor.

50 **Anchorage.**—**Buoys.**—It is prudent for a large vessel, arriving off Kotor, to moor; a fair berth is in a depth of 11 fathoms (20^m1), mud, with Sveti Ilija church, bearing 038° , distant about $1\frac{1}{2}$ cables.

There is anchorage in a depth of 9 fathoms (16^m5), off the mouth of the river, which is situated about a cable northward of the quay at

Charts 2713, 1440, 2158a, 2158b.

Charts 419, plan of Kotor harbour, 1463.

Kotor, and also, in about the same depth, north-westward of Sveti Ilija church.

There are some mooring buoys off the quay at Kotor, and steamers can lie alongside the quay. The water off the town is fresh, and the bottom of a vessel soon becomes clean. 5

See Prohibited anchorages, page 182.

Quays.—There are quays, where small vessels, with local knowledge, can berth, at Stoliv, at Prčanj, abreast Sveti Matija church, and at Muo (*Lat. 42° 26' N., Long. 18° 46' E.*). 10

Kotor.—This town lies at the foot of a rocky hill whose summit is separated by a wide valley from the steep mountain range eastward. The town is surrounded by an old Venetian wall. There is a military hospital in the town.

Supplies.—Small quantities of coal and fuel oil can be obtained. 15
Limited quantities of water and provisions can be obtained.

Charts 419, 1463.

Directions.—There is no difficulty in a steam vessel in entering and navigating the several branches of Boka Kotorska as long as the set of the variable currents is guarded against; the depth of water is sufficient for all classes of vessels. 20

Chart 1463.

Otočić Lastavica in the entrance is clear of danger and may be passed on either side. If unavoidably compelled to anchor in the entrance, where the general depths are from 20 to 25 fathoms (36^m6 to 45^m7), 25 care must be taken to avoid a rocky 7-fathom (12^m8) bank about 3½ cables south-westward of the fort on Rt Luštica as well as the telegraph cables.

In summer, to avoid the frequent calms near Rt Kobila, it is advisable for a sailing vessel to keep on the eastern side, where the anchor may be dropped, if unable to stem the current. This is also a better position to meet the heavy squalls which become more easterly than the regular breeze during heavy rains in the mountains. Care should be taken to avoid being set into the bay on the north-western side of the entrance, where there is often a heavy sea and the holding ground is bad. 35

A vessel may find temporary anchorage sheltered from easterly winds in Luka Žanjica eastward of Otočić Lastavica, but, to secure for a Bora, cables should be taken to the shore.

In a sailing vessel it is advisable to make the land from the southward on account of the current, and to steer for Mount Lovćen, to ensure a good position for entering. If the land should be made when steering at right angles to the coast, Mount Radostak, page 181, is a good mark for the entrance. See view B on chart 2713 and view on chart 1463. 40

During the fine season, if prevented by unfavourable winds from entering the gulf, a small vessel can anchor close inshore on any convenient part of the coast; but, except temporarily or in case of urgency, it is better to repair to Zaliv Traste. 45

If outward bound and, having passed Rt Kobila, the wind should be south-easterly with a heavy sea, and a current running, which when opposed by that from the gulf sets towards the bay in the north-western part of the entrance, the vessel should anchor immediately. She would then be in an exposed position, but would incur less risk 50

Charts 2713, 1440, 2158a, 2158b.

H*

Chart 1463.

than by attempting to proceed or by endeavouring to return to an inner anchorage, unless with a sufficiently favourable breeze to ensure stemming the out-going current.

- 5 If the offshore wind should be lost before rounding Oštri rt it may become necessary to anchor, as it might be impracticable to work out against the coast current and sea breeze.

- 10 After passing Oštri rt (*Lat. 42° 23' N., Long. 18° 32' E.*), if a vessel should be becalmed before having obtained a sufficient offing, she might be drifted into dangerous proximity with the coast between that point and Cavtat, 18 miles north-westward. Advantage should be taken of the offshore winds, which occur at all seasons, to secure a sufficient offing before they are overcome by the sea breeze.

- 15 It will be seen that on leaving the gulf in a sailing vessel during winter the strength of the currents often presents serious obstacles.

Charts 2713, 1440, 2158a, 2158b.

CHAPTER V

COAST OF YUGOSLAVIA FROM BOKA KOTORSKA TO KANAL MALOG STONA
AND ADJACENT ISLANDS WITH THE CHANNELS BETWEEN THEM.

Charts 2713, 2712.

COAST.—Between Oštri rt, the western entrance point of Boka Kotorska, and Rt Lovište, the north-western extremity of Poluotok Pelješac, 78 miles north-westward, the coast is backed, a short distance inland, by mountainous country with but little intervening space of cultivated ground. 5

Mijet, Lagosta and Korčula are the three most important of the adjacent islands. The others are thinly populated or uninhabited.

The coast from Oštri rt to Cavtat, about 18 miles north-westward, is rugged and of forbidding aspect. It is closely backed by mountains covered here and there with trees. See view B on chart 2713. The depths are considerable near the coast which should be given a wide berth as the sea breaks heavily in strong onshore winds, and violent eddies are caused by the current during succeeding calms or light winds. 15

Chart 1463.

About 6 miles north-westward of Oštri rt (*Lat. 42° 23' N., Long. 18° 32' E.*) there is a small peninsula, 450 feet (137^m2) high, which projects north-westward and south-eastward, forming a bay on either side of it. Otok Molunat, 160 feet (48^m8) high, lies close off the south-eastern projection of this peninsula. 20

Measured distance.—Beacons.—There is a measured distance off the coast between Otočić Lastavica, page 181, and Otok Molunat, marked by pairs of beacons, each beacon consisting of a white stone pyramid surmounted by a red circle. 25

The course, about 323°, is marked by a pair of beacons, about three-quarters of a cable apart, situated near the summit of Otok Molunat.

The front beacon of the south-easternmost pair is situated on the north-western end of Otočić Lastavica, with the rear beacon on the mainland, bearing about 053°, distant about half a mile. 30

The front beacon of the pair next north-westward is situated on the extremity of Oštri rt, with the rear beacon on the mainland, bearing about 053°, distant about 1½ miles.

The third pair of beacons are situated, close together, on the isthmus at the head of Uvala Prevlaka (Oštri cove), about 1½ miles north-westward of Oštri rt. 35

Charts 2713, 1440, 2158a, 2158b.

Chart 1463.

The fourth pair of beacons are situated, close together, about 2 cables southward of the village of Bezboge; about $3\frac{1}{2}$ miles north-westward of Ostri rt (*Lat.* $42^{\circ} 23' N.$, *Long.* $18^{\circ} 32' E.$).

- 5 The distance on the course between the first and second pair of beacons is 3,181 feet (969^m6), between the second and third pair, 8,299 feet (2,529^m5), and between the third and fourth pair, 13,373 feet (4,074^m1).

Coast.—Luka veliki Molunat, the bay which lies on the northern side of the peninsula previously mentioned, is a temporary refuge from south-easterly gales for sailing vessels. It is open north-westward whence at times a heavy sea sets in. It is usual for a vessel to anchor near the middle in a depth of about 11 fathoms (20^m1), sand and mud, and in the Bora to lay out cables to the shore.

15 *Chart 1463, plan of Molunat harbour.*

Luka mali Molunat, the south-eastern bay, is protected by Otok Molunat. A reef extends half a cable off the south-eastern side of the island, and a bank, over which there are depths of less than 5 fathoms (9^m1), extends about 2 cables north-north-eastward from the eastern extremity of the island; Otočić Supetrić, 19 feet (5^m8) high, and fringed by a narrow reef, lies on this bank. The channel into the harbour, between this bank and another bank, with depths of less than 5 fathoms (9^m1) over it, extending about half a cable from the mainland north-eastward, is very narrow, and has depths of about 25 6 fathoms (11^m0) in the fairway. The northern and western shores of the harbour are fringed by a narrow, shallow bank. It is quite safe for small vessels in a Bora or during north-westerly winds; south-easterly winds send in a heavy sea, but there is no danger if the vessel is securely moored. The best anchorage is about $1\frac{1}{2}$ cables north-westward of Otočić Supetrić, in a depth of about 4 fathoms (7^m3), good holding ground. There is a small quay, with a depth of 7 feet (2^m1) alongside, in the harbour.

The small sailing vessels which frequent this harbour do not attempt it with south-easterly winds and rough weather owing to the sea and to the outset then found in the narrow entrance. Neither is it advisable to attempt to enter either of the Molunat harbours early in the forenoon, as even a fresh south-easterly breeze commonly fails on near approach to the land at that time, and a considerable sea would probably be encountered.

40 Sniježnica, a mountain (chart 2713), 4,050 feet (1,234^m4) high, standing about $8\frac{1}{2}$ miles north-north-westward of Molunat light and 4 miles inland, is a good guide when making any port on this coast. It has a bare summit and may easily be identified, being one of the highest mountains on this part of the coast; between it and the

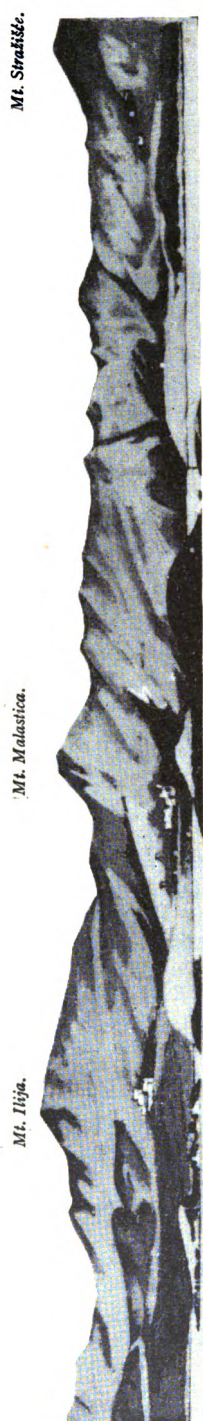
45 mountains bordering Boka Kotorska, the land is comparatively low.

Ilijino (Ilino) brdo, a mountain, 1,840 feet (560^m8) high, with a chapel on its summit, slopes to the shore about $2\frac{1}{2}$ miles north-north-westward of the peninsula; this and the high lands of Kotor southward, point out the position of the Molunat harbours, and on nearing 50 the peninsula, its greyish wall-like sides are readily distinguished. The country in the neighbourhood is covered with brushwood.

Light.—A light is exhibited, at an elevation of 29 feet (8^m8), from a red iron pyramidal structure, situated on the north-eastern side of the entrance to Luka mali Molunat.

Charts 2713, 1440, 2158a, 2158b.

To face page 195.



Otočić
Bozna,
bearing S 57° E, 3 miles.

Otočić Mrkan.

Rt Susjcrpan.

Approach to Cavtat.

(Original dated 1910.)

Chart 2713.

Coast.—Danger.—Beacon.—Rt Veliki Pač (Patkio) (*Lat.* 42° 31' N., *Long.* 18° 18' E.) lies about 8 miles north-westward of Molunat light-structure, and about three-quarters of a mile further north-westward and a cable offshore, there is a rock, with a depth of 1½ fathoms (2^m7) over it and depths of from 5 to 12 fathoms (9^m1 to 21^m9) between it and the coast, but steep-to on its south-western side. 5

Chart 1582, plan of Ports of Cavtat.

Rt Sustjepan, about 5 miles north-westward of Rt Veliki Pač, is the extremity of a narrow tongue of land, 154 feet (46^m9) high, projecting north-westward. There is a chapel on the point and a beacon, painted in red and black bands and surmounted by a ball, stands about 2 cables south-eastward of it. 10

Off-lying islets.—Cavtatski grebeni, consisting of the islets of Mrkan and Bobara and several above-water rocks, lie off this part of the coast and afford protection from south-westerly winds to Cavtatska (Cavtat) luka and Žaliv Tiha. 15

Otočić Mrkan, the south-eastern and larger, is 220 feet (67^m1) high; it lies with its south-eastern extremity about three-quarters of a mile south-westward of Rt Sustjepan and is steep-to except for some 20 above-water and sunken rocks lying close offshore in places; a chain of above-water and sunken rocks extends about 2 cables south-eastward of this islet.

Otočić Bobara, the north-western islet, is 147 feet (44^m8) high, and lies with its south-eastern extremity about 6 cables north-westward of Otočić Mrkan. A chain of above-water rocks extends south-eastward of Otočić Bobara, leaving a clear channel, 2½ cables wide, between it and Mrkan. Bobara and the chain of rocks south-eastward of it, are covered by the red sector of Cavtat light between the bearings of 83° and 110°. 30

These islets have steep, rocky coasts; the current between them and the mainland sets north-westward at the rate of about half a knot.

See view facing this page.

Cavtatska luka.—Danger.—Buoy.—Cavtatska luka, entered between Rt Sustjepan and Rt Sveti Roko, about 3 cables north-eastward, is situated at the southern end of Župski zaliv, which latter bay is entered between Rt Sustjepan and Rt Pelegrin, about 2½ miles north-westward. 35

Rt Sveti Roko is the extremity of a peninsula, 135 feet (41^m1) high, extending north-westward; the town of Cavtat stands on this peninsula. 40

Otočić Supetar, 59 feet (18^m0) high, lies on the north-eastern side of the approach to Cavtatska luka, about half a mile north-westward of Rt Sveti Roko. Hrid Šuperka, bordered by a shallow rocky bank, is situated nearly midway between Otočić Supetar and Rt Sveti Roko. 45

A rocky spit, at the outer end of which there is a depth of one fathom (1^m8), extends about a cable south-westward from Rt Sveti Roko. Otočić Supetar, Hrid Šuperka, and this spit are covered by the green sector of Cavtat light, between bearings of from 129° to 158°.

A shoal, with a depth of 1½ fathoms (2^m3) over it, lies 3 cables west-north-westward of Cavtat light. A red conical buoy, surmounted by a white ball, is moored on the western edge of this shoal. The shoal is covered by the red sector of Cavtat light between the bearings of from 083° to 110°. 50

Charts 2713, 1440, 2158a, 2158b.

Chart 1582, plan of Ports of Cavtat.

The channels into the harbour are on either side of the 1½-fathom (2^m3) shoal, that between the shoal and Rt Sustjepan being the wider, and lying in the *white* sector of Cavtat light between bearings of 5 from 053° to 083°.

Light.—A light is exhibited, at an elevation of 33 feet (10^m1), from an iron column, 16 feet (4^m9) in height, situated on the northern side of the harbour and 2 cables southward of Rt Sveti Roko (*Lat.* 42° 35' N., *Long.* 18° 13' E.).

10 **Anchorage.**—In Cavtatska luka, which is open north-westward, there is accommodation for only a few small vessels, which haul close in and secure to the shore. In the middle of the harbour, the bottom consists of mud and sand. There is a depth of 12 feet (3^m7) alongside the quay at the north-eastern end of the head of the harbour.

15 **Cavtat.**—The immediate neighbourhood of the town is cultivated, but within a short distance the land is high and barren.

The population was about 770, in 1931.

Charts 1582, plan of Ports of Cavtat, 2713.

Župski zaliv.—**Anchorage.**—There is good anchorage in the 20 eastern part of Župski (Tiha) zaliv for vessels of any draught either in a Bora or in south-easterly gales, in depths of from 15 to 20 fathoms (27^m4 to 36^m6), mud and good holding ground. Zaliv Tiha, entered between Rt Sveti Roko and Rt Prahlijvac (Prahglivaz), about 6 cables north-eastward, also affords anchorage eastward or east-north- 25 eastward of Rt Sveti Roko, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), mud and sand; in a less depth, the holding ground is not to be depended on.

A heavy sea is raised by south-westerly and north-westerly winds, it is then necessary to avoid anchoring close to the shore. In these 30 winds, small craft generally resort to Zaliv Tiha, where they secure to the shore.

It is reported that Zaliv Tiha affords good shelter for small vessels in any wind, and that even with northerly winds no sea is raised. In the southern part of the bay the holding ground is said to be good.

35 At Kupari, a village situated about a mile north-eastward of Rt Pelegrin, there is a small mole, with a depth of 12 feet (3^m7) alongside.

The valley at the north-western end of Župski zaliv is a plain backed by high land.

Stražišće, a mountain, 2,300 feet (701^m0) high, about 2 miles east- 40 north-eastward of Cavtat light-structure, is a good mark, but it is advisable to make the land well south-eastward of Župski zaliv, on account of the north-west-going current. A large vessel entering Župski zaliv, should take the clear passage northward of Bobara and Supetar.

45 *Chart 2713.*

Coast.—Between Rt Pelegrin and Dubrovnik, about 3½ miles west-north-westward, the coast is barren, rocky and steep-to.

Chart 1582, plan of Dubrovnik.

Lokrum, an island, lies in the approach to Dubrovnik, with its 50 northern extremity (*Lat.* 42° 38' N., *Long.* 18° 07' E.) about 3½ cables south-south-eastward of the southern mole at that place. The island is rocky and steep-to; it is covered with trees and bushes and is 298 feet (90^m8) high near its northern end, and 180 feet (54^m8) high, at its southern end. When seen from south-westward, it appears to be

Charts 1440, 2158a, 2158b.

Chart 1582, plan of Dubrovnik.

divided into two. A ruined fort stands on its northern part, and on the flat part southward there is a monastery.

Dubrovnik.—Lights.—There is a roadstead between the northern end of Lokrum and the mainland. It is exposed to a heavy sea during south-easterly winds, at the first sign of which vessels proceed to Koločepski kanal, page 200, or if obliged to remain, haul close under the northern coast of the island and secure to stone bollards there. In this position, they often ride out heavy weather, but this anchorage should only be resorted to in summer. South-westerly winds send in a heavy sea; the bottom, which consists of sand, shells and weed, is not very reliable. There is no shelter at this anchorage from southerly winds.

The small harbour eastward of the town has space for a few small vessels in a depth of about 2 fathoms (3^m7). South-easterly winds cause a heavy sea at the entrance, which is between two small moles rendering access difficult and, at times, impracticable. The northern mole is separated from the coast northward by a narrow, shallow, rocky channel.

Sniježnica, page 194, is a good guide for making Dubrovnik; on a nearer approach, Fort Srd, situated on a hill, 1,350 feet (411^m5) high, about half a mile northward of Dubrovnik, and the dark green island of Lokrum help to identify the town and anchorage. The dark peaks of Mount Petka, about 1½ miles westward of the town, are also conspicuous.

A light is exhibited, at an elevation of 24 feet (7^m4), from an iron column, 18 feet (5^m5) in height, on the southern molehead (*Lat.* 42° 38' N., *Long.* 18° 07' E.).

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 13 feet (4^m0) in height, on the quay.

Town.—Dubrovnik, with a population of about 10,000 in 1931, is surrounded by a wall. Limited quantities of provisions are obtainable. There is a hospital for infectious diseases about a mile eastward of the town and also a military hospital.

The town is connected to Hercegnovi by rail.

Meteorological tables.—See page 27.

Charts 3675, 1582, plan of Dubrovnik.

Coast.—Beacon.—Between Dubrovnik and Rt Petka, about 2 miles westward, the coast is cliffy, covered with bushes and steep-to. Mount Petka has two peaks, the higher of which, known as Velika Petka, attains an elevation of 648 feet (197^m5); it is covered with fir trees and has reddish brown cliffs on its seaward side and it terminates in Rt Petka, which is high. See view on chart 1582.

There are two above-water rocks on the western end of a reef which lies about three-quarters of a cable north-westward of Rt Petka and from a half to one cable offshore.

Grebeni, a chain of abrupt, jagged, above-water rocks, which are bare and of a reddish colour, lie westward of Rt Petka, from 2½ to 6 cables offshore; the western end of the western rock is almost steep-to, but a shoal, with depths of less than 5 fathoms (9^m1) over it, extends about half a cable northward of the chain. A spit, with a depth of 4½ fathoms (8^m7) at its extremity, extends about three-quarters of a cable eastward of the easternmost rock, leaving a passage, half a cable wide, between it and the two above-water rocks north-westward

Charts 2713, 1440, 2158a, 2158b.

Charts 3675, 1582, plan of Dubrovnik.

of Rt Petka; this passage is convenient for small vessels, with local knowledge.

The south-easternmost entrance to Koločepski kanal, page 200, lies between the westernmost of the Grebeni (*Lat. 42° 39' N., Long. 18° 03' E.*) and Rt Gornji, the south-eastern extremity of the island of Koločep, about $1\frac{1}{4}$ miles west-north-westward. See view on chart 1582 and view facing this page.

Sveti Martin (Sumartin) bay, situated north-eastward of Grebeni, between Rt Petka and Gujilište or Lapad point, the western extremity of Lapad peninsula, about half a mile northward, is dangerous in winter being much exposed westward and south-westward. It is resorted to by small craft for protection against the Bora and Scirocco. The anchorage is in depths of from 12 to 14 fathoms (21^m9 to 25^m6). Gujilište point is high and covered with trees.

Chart 3675.

Gujilište bank, with a depth of 5 fathoms (9^m1) over it, lies about a cable north-westward of Gujilište point.

The western end of Lapad peninsula is fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, about half a cable wide. A shallow, rocky bank extends about half a cable off one part of the northern side of Lapad peninsula; the outer edge of this bank is marked by a conspicuous black stone beacon, 8 feet (2^m4) high, surmounted by a cone, standing in a depth of one fathom (1^m8). Depths of less than 5 fathoms (9^m1) extend about half a cable northward of this beacon. The shore, westward of this beacon, is bordered by a rocky bank covered with mud.

Otočić Daksa, 79 feet (24^m1) high, lies about $3\frac{1}{2}$ cables northward of Gujilište point and about 2 cables off the north-western side of Lapad peninsula, in the fairway of the channel leading to Gruž and Dubrovačka inlet. On the western side of the islet, there is a bay, and there are some buildings on the islet.

Lights.—A light is exhibited, at an elevation of 87 feet (26^m5), from a square tower on a dwelling, 41 feet (12^m5) in height, on the summit of the westernmost of the Grebeni (*Lat. 42° 39' N., Long. 18° 03' E.*). See view.

A light is exhibited, at an elevation of 64 feet (19^m5), from an octagonal stone tower, 42 feet (12^m8) in height, on the northern end of Otočić Daksa.



Grebeni lighthouse.

GRUŽ.—Dangers.—Buoy.—The harbour of Gruž is situated on the southern side of the entrance to Dubrovačka inlet and is entered between the north-eastern extremity of Lapad peninsula and Rt Kantafig, about 2 cables north-north-eastward.

A rock, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies on the north-eastern side of the harbour about 3 cables south-eastward of Rt Kantafig and close off the quay on that side; this rock is marked by a conical buoy, surmounted by a cylinder. There are depths of from 3 to 5 fathoms (5^m5 to 9^m1) between the rock and the quay, and depths of $3\frac{1}{2}$ fathoms (6^m9) close westward of the rock, whence the depths increase rapidly towards the centre of the harbour, but the bottom is foul.

Charts 2713, 1449, 2158a, 2158b.



Lopud.

Rt Poluga.

Kolotep.

Gornja point.

Mt. Petka.

Fort Srd.



Zaton Hr.

Groheni I
lighthouse, bearing 038°
distance 2½ miles.

Dubrovnik.

Lokrum I.

View in 2 parts of the south-easternmost entrance to Koločepski kanal.
(Original dated 1910.)

Chart 3675.

On the south-western side of the harbour, abreast the rock just mentioned, a bank, with depths of less than 5 fathoms (9^m1) over it, extends about three-quarters of a cable offshore. Šipak rock, with a depth of 2½ fathoms (5^m0) over it, lies near the edge of this bank, about 2½ cables southward of Rt Kantafig. 5

A spit, with a depth of 3 fathoms (5^m5) over it, extends about half a cable offshore, about 4 cables southward of Rt Kantafig.

Lights.—A light is exhibited, at an elevation of 25 feet (7^m6) from an iron hut, 23 feet (7^m0) in height, on Rt Kantafig (*Lat.* 42° 40' N., 10 *Long.* 18° 07' E.).

A light is exhibited, at an elevation of 22 feet (6^m7), from an iron column, 17 feet (5^m2) in height, on the head of Petka mole.

Anchorage.—Quays.—The harbour is mostly lined with quays. On the eastern side there is a length of 2,000 feet (609^m6) of quay, 15 where ocean-going steamers can berth; the least depth alongside this length of quay, 18 feet (5^m5), is off the timber yard, at its northern end. Close southward of this, there is another quay, 750 feet (228^m6) long, with a least depth of 15 feet (4^m6) alongside. Petka mole, with depths of about 8 feet (2^m4) at its root, increasing to about 20 feet (6^m1) at 20 its head, projects from the eastern side, about 6 cables south-eastward of Rt Kantafig.

Vessels are not, as a rule, allowed to anchor in the harbour; if no berth is available at the quays, they anchor outside between Otočić Daksa and the village of Lozica, on the mainland, about half a mile 25 east-north-eastward, but anchorage westward of the islet is recommended as affording greater protection from north-easterly winds during thunderstorms.

Directions.—See page 200.

Town.—The town of Gruž, officially known as Dubrovnik II, lies 30 on the eastern side of the harbour.

The health office, railway station, Harbour Master's office and customs house are all on the eastern side of the harbour. The Yugoslav Naval Academy is south-eastward of the head of the harbour.

On the shores of the harbour there are numerous villages amidst 35 cultivated grounds. The population was about 2,490, in 1931.

Harbour facilities.—Fresh provisions can be procured. Water can be supplied alongside from a water-boat. A supply of coal cannot be relied upon.

Fuel oil can be supplied at the rate of 600 tons in 12 hours. 40

There are two travelling cranes of about 3 tons capacity.

The principal exports are wood and minerals.

Communications.—Gruž is in regular steamer communication with other ports. The town is connected to the general railway system. 45

Consular Officer.—A British Consular Officer resides at Gruž.

Dubrovačka inlet.—Telegraph cable.—Beacons.—Dubrovačka inlet, which is narrow, is entered between Rt Kantafig and Leandra point, about 2½ cables north-westward. Both shores are covered with houses and cultivation. About three-quarters of a mile east-north-eastward of Rt Kantafig and 2 cables southward of the village of Mokošica, there is a small projection from the northern side; depths of less than 3 fathoms (5^m5) extend a short distance from this projection. On the western side of this projection, there is a quay along-

Charts 2713, 1440, 2158a, 2158b.

Chart 3675.

side which small vessels can berth ; it is dangerous to remain alongside this quay in strong south-westerly winds.

On the southern side of the inlet, near the village of Sastjepan, 5 opposite Mokošica, there are two quays, alongside which large vessels can berth, one in front of the coal depôt and one in front of the oil depôt.

In winter the out-going current is strong. A stream flows into the head of the inlet, where there is a bar, with a least depth of $1\frac{1}{2}$ fathoms 10 (2^m3) over it ; small craft, drawing 8 feet (2^m4) can ascend this stream to the source at the springs, about three-quarters of a mile above the mouth.

A telegraph cable, indicated on the chart, crosses the entrance of Dubrovačka inlet from a position about one cable eastward of Rt 15 Kantafig. Each end of the cable is marked by a beacon.

Light.—A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column on a white concrete tower, 18 feet (5^m5) in height, on the projection, on the northern side of the inlet, southward of Mokošica (Lat. 42° 40' N., Long. 18° 06' E.).

20 **Anchorage.**—Sailing vessels occasionally anchor close off the northern shore of this inlet to shelter from the Bora, which sometimes blows violently along the direction of the inlet. Southerly and south-westerly winds do not last long, and are never very inconvenient. There are several mooring buoys in the inlet.

25 *Charts 3675, 2713.*

Directions.—When approaching from south-eastward, the high land near Dubrovnik should be steered for as soon as visible, in order to profit by the north-west-going current. A vessel should pass through the channel between the Grebeni and the island of Koločep. 30 In south-easterly winds, a vessel should beware of heavy squalls over Sveti Martin bay and out of Dubrovačka inlet, which draw more eastward than the regular breeze.

For approach from westward, *see* directions for Koločepski kanal, page 207.

35 Proceeding to Dubrovačka inlet or Gruž, Otočić Daksa may be passed on either side. In passing southward the islet, the north-western side of the channel should be preferred on account of the bank bordering the south-eastern side.

Entering Gruž, a vessel should keep to the fairway, passing within 40 half a cable of the buoy marking the rock on the eastern side of the harbour.

Approaching Gruž, in 1945, a strong south-west-going current was experienced off Leandra point.

Chart 2713.

45 **KOLOČEPSKI KANAL.**—**General description.**—Koločepski (Koločep) kanal lies between the mainland and a chain of islands, of which the principal are Koločep, Lopud, Šipan, Jakljan and Olipa, lying parallel with the mainland, together with the islet of Sveti Andrija, which lies in the southern approach to the passage between 50 Koločep and Lopud.

The channel extends from the westernmost of the Grebeni to the south-eastern extremity of Poluotok Pelješac, about 15 miles north-westward. The channel is easy to enter at all seasons, and affords

Charts 2713, 1440, 2158a, 2158b.

Chart 2713.

good anchorages, page 203, the holding ground being good almost throughout.

The south-easternmost entrance, page 198 is the widest and the most frequented, especially by vessels approaching from southward; this passage is clear of dangers. The other entrances and the islands on the south-western side are described on pages from 204 to 206.

Chart 3675.

Channel.—Between Leandra point and Malfi point, about $1\frac{1}{4}$ miles north-westward, the north-eastern side of the channel is sterile. The harbour of Zaton is entered between Malfi point and Rt Bat, about $2\frac{1}{4}$ cables west-north-westward (*Lat.* $42^{\circ} 41' N.$, *Long.* $18^{\circ} 03' E.$).
Chart 2713.

Westward of the harbour of Zaton, there are numerous houses and the land is cultivated. The anchorage off this part of the coast and also that in the harbour of Zaton are convenient for a vessel bound to, but unable to enter, the harbour of Gruž during south-easterly winds, though as previously stated, anchorage westward of Otočić Daksa is preferable to that inside it.

The harbour of Zaton is an inlet and south-westerly winds raise a considerable sea; the coves on the western side afford shelter to small vessels, with local knowledge. Abreast the village of Zaton, on the western side of the harbour, there is a shoal, with a depth of $2\frac{1}{4}$ fathoms (4^m6) over it.

The coast between Rt Bat and Gornja point, the south-eastern entrance point of Slanska luka, about 9 miles north-westward, forming the north-eastern side of Koločepski kanal, is steep-to, with several villages on the heights within it, the coves in the vicinity of which serve as harbours for fishing boats. The village of Tršteno, $3\frac{1}{4}$ miles north-westward of Rt Bat, is surrounded by luxurious vegetation and is situated on the eastern side of Uvala Tršteno, where there is a small artificial harbour.

There is a breakwater at Brsečine cove, about a mile north-westward of Tršteno, within which small craft, drawing about 6 feet (1^m8) can find good shelter. On the south-western side of Koločepski kanal, Rt Ratac, the northern extremity of Koločep, lies about $1\frac{1}{4}$ miles westward of Rt Bat and three-quarters of a mile off the mainland north-eastward. There is a small bay, the head of which is shallow, on the western side of Rt Ratac. Koločepška Vrata lies between Rt Čavalika, the western extremity of Koločep, and Rt Poluga, the eastern extremity of Lopud, half a mile west-north-westward.

A shoal, with depths of 4 fathoms (7^m3) over it, extends a short distance off the north-eastern side of Lopud, and Mihalja (S. Mihovil), an islet, lies on a shallow spit which extends a short distance off the northern extremity of the island.

Lopudska Vrata enters the south-western side of Koločepski kanal between Mihalja and the eastern extremity of Šipan, about $1\frac{1}{4}$ miles north-westward.

Ruda, an islet, 265 feet (80^m8) high and covered with bushes, lies in this entrance, about three-quarters of a mile north-westward of Mihalja. A spit, with a depth of 4 fathoms (7^m3) at its outer end, and on which there is a rock, 10 feet (3^m0) high, extends about 2 cables north-westward of Ruda.

The north-western extremity of Šipan, with Mišjak, an islet, 46 feet

Charts 2713, 1440, 2158a, 2158b.

Chart 2713.

(14^m0) high, close off it, lies about 2½ miles south-westward of Gornja point, page 201; north-westward of this, the channel widens.

Chart 2713, plan of Port Slano.

- 5 Slanska (Slano) luka, page 206, is entered on the north-eastern side of the channel, between Gornja point and Rt Donja, about 2 cables north-north-westward.

Chart 2713.

- On the southern side of the north-western end of the channel, the
10 north-western entrance to Prolaz Harpotil lies between the north-western end of Šipan and Seka point, the north-western extremity of the island of Jakljan, about 1½ miles westward; Tajan, an islet, 249 feet (75^m9) high, and covered with brushwood, lies about 1½ cables north-eastward of Seka point (*Lat. 42° 45' N., Long. 17° 47' E.*).

- 15 Veliki Vratnik lies between Seka point and the south-eastern extremity of Olipa, an island, about half a mile west-north-westward; the width of this entrance is contracted by some above-water rocks which lie on a spit extending a short distance off Seka point, and by a narrow, shallow bank which fringes the eastern side of Olipa. See view facing
20 page 206.

- Mali Vratnik, about 185 yards (169^m2) wide, the north-westernmost entrance to Koločepski kanal, lies between the western side of Olipa and Rt Nožice (Nosice), the south-eastern extremity of Poluotok Pelješac, westward; Rt Nožice is overgrown with brushwood. This
25 passage leads into the head of Pristanište Ladro, the entrance to which lies between the outer end of a projection, on the north-eastern side of Olipa, and Veljara point, about half a mile north-westward.

- On the northern side of this part of Koločepski kanal, Zaliv Maestro
30 lies between Rt Donja and Rt Grbljava, about 4 miles west-north-westward. This bay is the largest and best anchorage in the channel. The sides of Zaliv Maestro are indented. Between Rt Donja and Svi Sveti point, about 1½ miles north-westward, there is a bight, fringed by a narrow, shallow bank. A detached 3-fathom (5^m5) patch, lies
35 about 1½ cables off the eastern side of the bight. Janska cove lies close northward of Svi Sveti point and Budima cove about half a mile farther north-westward. In Podstine cove, at the head of Janska cove, there is a small quay, with depths of 11 feet (3^m4) alongside.

- Uvala Doli, where there is a small mole, lies on the north-western
40 side of Zaliv Maestro, about 1½ miles north-north-eastward of Rt Grbljava. Bogutovac, an islet, light in colour and covered with grass, lies on the outer end of a shallow bank which extends about 2 cables southward from the southern entrance point of Uvala Doli.

- In calms and contrary winds, the coast between Budima cove and
45 Uvala Doli should not be approached in a sailing vessel, as submarine springs occasion considerable eddies.

Kanal Velikog Stona, page 207, is entered between Rt Grbljava and Veljara point.

- Telegraph cable.**—A cable, indicated on the chart, is laid across
50 the north-western part of Koločepski kanal from the north-western end of Šipan to the mainland north-eastward.

Vessels are prohibited from anchoring in the vicinity of this cable.
Chart 3675.

Lights.—A light is exhibited, at an elevation of 54 feet (16^m5),

Charts 1440, 2158a, 2158b.

Chart 3675.

from an iron column on a masonry base, 11 feet (3^m4) in height, on Rt Bat.

Chart 2713.

A light is exhibited, at an elevation of 46 feet (14^m0), from a pylon 5 on a white iron hut, 36 feet (11^m0) in height, on Tiha point, about a mile eastward of the north-western extremity of Sipan (*Lat.* 42° 45' N., *Long.* 17° 50' E.).

A light is exhibited, at an elevation of 46 feet (14^m0), from the southern corner of a dwelling, 11 feet (3^m4) in height, on Rt Donja, *see view.*

*Rt Donja lighthouse.*

A light is exhibited, at an elevation of 103 feet (31^m4), from a white square stone tower and dwelling, 15 36 feet (11^m0) in height, on Južni rt, the southern extremity of Olipa. *See view.*

*Olipa islet light-tower.*

A light is exhibited, at an elevation of 136 feet (41^m4), from an iron pyramidal structure, 23 feet (7^m0) in height, on Rt 20 Grbljava.

*Chart 3675.***Anchorage in Koločepski kanal.—**

Between Dubrovačka inlet and the harbour of Zaton there is excellent shelter off the 26 coast, in depths of from 18 to 20 fathoms (32^m9 to 36^m6).

Chart 2713.

The anchorage in the harbour of Zaton is preferred by sailing craft to those at Gruž and in Dubrovačka inlet, it being easy to enter in south-easterly winds and to quit in those from the opposite quarter. 30

One of the best anchorages in the channel is between Koločep and the mainland. Large vessels seeking shelter from a south-easterly gale generally anchor, in a depth of 15 fathoms (27^m4), sand and hard mud, with Otočić Sveti Andrija in line with Rt Čavalika; here the swell from outside is felt, but south-easterly winds seldom last long enough 35 to raise a heavy sea.

Vessels never anchor in mid-channel when anticipating bad weather, but on entering from southward proceed to the harbour of Zaton, or, if prevented by stress of weather, to the anchorage in the small bay on the western side of the northern extremity of Koločep, but a 40 vessel entering the latter, should not proceed too far in; only north-westerly winds are much felt in this bay; the holding ground is good, and there are bollards to make hawsers fast to on the north-eastern shore.

There is anchorage outside Slanska luka, off Gornja point, in depths 45 of more than 20 fathoms (36^m6), the sea in the channel caused by the Scirocco being slightly felt here.

In Zaliv Maestro, anchorage off the north-eastern side, between Slanska luka and Budima cove, should be preferred, and it is customary, in anticipation of a Bora, for small vessels to lay out cables to the shore. 50 The depth near the middle of the bay is about 32 fathoms (58^m5), greenish mud, and from 11 to 22 fathoms (20^m1 to 40^m2), sand and mud, at a short distance offshore.

Budima and Janska coves and Uvala Doli afford good shelter to small

Charts 1440, 2158a, 2158b.

Chart 2713.

vessels, with local knowledge, but in the first of these the Bora blows strongly; Janska cove is the best.

In Pristanište Ladro, a vessel of deep draught may moor, sheltered from all winds except the Bora, in depths of from 10 to 27 fathoms (18^m3 to 49^m4), mud.

Islands and passages on the south-western side of Koločepski kanal.—**Koločep.**—The island of Koločep, the south-easternmost of the chain forming the south-western side of Koločepski kanal, is 410 feet (125^m0) high at its western end and its southern peak is covered with pine trees. The south-western side of the island is rocky and bare and forms a bight in the eastern part, where shelter may be obtained from a Bora, in depths of from 12 to 18 fathoms (21^m9 to 32^m9), from 1½ to 3 cables offshore; farther westward the bottom is rocky.

Off-lying islet.—**Light.**—Otočić Sveti Andrija, partly covered with low bushes and with a convent on it, lies in the southern approach to Koločepška Vrata, about 2½ miles south-westward of Rt Čavalika, the western extremity of Koločep. This islet is precipitous on its south-western side.



Otočić Sveti Andrija lighthouse.

A light is exhibited, at an elevation of 226 feet (68^m9), from a square tower on a dwelling, 56 feet (17^m1) in height, on Otočić Sveti Andrija (Lat. 42° 39' N., Long. 17° 57' E.).

Koločepška Vrata.—Dangers.

—Koločep is divided from Lopud by Koločepška Vrata, which is half a mile wide between Rt Čavalika and Rt Poluga, the eastern extremity of Lopud; being very short, this

passage is easily navigated even with a scant wind.

Skupio (Skupieli), an islet, 50 feet (15^m2) high, with a 3-fathom (5^m5) patch close eastward of it, lies in the south-western approach to the passage, about half a mile south-westward of Rt Poluga. This islet is dark and not easily distinguished.

Čavalika shoal, with a depth of about one fathom (1^m8) over it, lies in the fairway, a short distance westward of Rt Čavalika. The best channel is between this shoal and Lopud, but there is a depth of 8 fathoms (14^m6) between the shoal and Koločep.

Anchorage.—There is good shelter from northerly and westerly winds in the small bay on the south-eastern side of Lopud, westward of Rt Poluga, but south-easterly winds send in a heavy sea. The best berth is near the middle of the bay, in depths of from 4 to 9 fathoms (7^m3 to 16^m5), sand. When approaching from southward, a good berth must be given to the rocks off the southern entrance point of the bay.

Lopud.—This island is 70 feet (21^m3) high; the south-western and south-eastern sides of the island are rocky and fringed in places by narrow reefs. Trees and brushwood give a dark appearance to Lopud in contrast with the bare appearance of the south-western side of Koločep. See view on chart 1582 and view facing page 198.

Lopudska Vrata.—**Light.**—Lopudska Vrata is entered between Benešin rt, the western extremity of Lopud and Rt Prtuša, the south-

Chart 2713.

eastern extremity of Šipan, about 8 cables north-westward. It is one of the best passages into Koločepski kanal, especially in north-westerly winds, and is deep. Lopudski zaliv, with the village of Lopud on its eastern side, lies on the south-eastern side of the passage, and Sudurad cove, with a village of the same name at its head, on the north-western side. 5

Ruda, page 201, reduces the width of the channel to about 7 cables, and makes it somewhat impracticable to beat through with south-easterly or north-westerly winds, or except in fine weather. 10

Light.—A light is exhibited, at an elevation of 15 feet (4^m6), from an iron column, 14 feet (4^m3) in height, on the head of a small mole at the village of Lopud (*Lat.* 42° 41' N., *Long.* 17° 57' E.).

Anchorage.—Lopudska Vrata affords good anchorage for vessels prevented by calms or contrary winds from proceeding through Koločepski kanal both in Sudurad cove, where vessels can anchor abreast the village in depths of from 8 to 11 fathoms (14^m6 to 20^m1), good holding ground, and also in Lopudski zaliv. This anchorage is sheltered from easterly and south-easterly winds, but those from westward cause a considerable sea; the best berth is towards the eastern shore of the bay, in depths of from 11 to 18 fathoms (20^m1 to 32^m9), mud and sand. Small craft, with local knowledge, can berth alongside the outer end of the mole at Lopud. 15 20

Telegraph cables.—Submarine cables, indicated on the chart, are laid across both Koločepška Vrata and Lopudska Vrata. 25

Šipan.—This is the largest and the most thickly populated of this chain of islands; it is 794 feet (242^m0) high at its northern part. Šipan may be identified by Sveti Ilija, a coniform hill, 732 feet (223^m1) high, about 2 miles from its south-eastern extremity; its coast is rocky and bold, rising in a series of wooded hills with fertile valleys between. 30

Prolaz Harpotl.—This passage lies between the north-western end of Šipan and the island of Jakljan, south-westward; its southern part is narrow and tortuous between the north-western end of a projection, extending north-westward from the south-western side of Šipan, and the south-eastern end of Jakljan. A sunken rock lies close off the south-western side of this part of the entrance, about 3 cables north-north-westward of the south-eastern extremity of Jakljan; a shoal, with a depth of 2½ fathoms (4^m6) over it, extends a short distance northward from the extremity of the projection on the eastern side of the entrance. 35 40

The remainder of this passage consists of an extensive bay with Luka Šipanska at its head, about 2 miles south-eastward of the north-western extremity of Šipan. The north-eastern side of Jakljan, forming the south-western side of this bay, is indented and is covered with brushwood interspersed with patches of cultivation, and there are houses on its eastern slope. Several islets lie off this side of the bay; Kosmač, the south-easternmost, is 85 feet (25^m9) high, and lies about 6 cables south-south-westward of the north-western extremity of Šipan; Crkvina, 220 feet (67^m1) high, lies about half a mile north-westward of Kosmač and close offshore; an above-water rock lies nearly midway between these two islets; Tajan, the north-westernmost, page 202, lies about 3 cables north-westward of Crkvina. 50

If a vessel should be forced to attempt this entrance, Šipan should be kept aboard. 55

Charts 1440, 2158a, 2158b.

Chart 2713.

Anchorage.—Light.—The northern part of Prolaz Harpoti is protected on all sides, the bottom throughout is hard mud, and vessels may safely anchor in any part, near enough to the shore to lay out
5 cables to it. The anchorage off Luka Šipanska would be preferable to all others in Koločepski kanal were it not so far from the mainland and so difficult of access by sailing vessels in south-westerly winds.

There is anchorage either east-north-eastward or west-north-westward of Kosmač, both positions being well protected from the Bora ;
10 there is also anchorage south-westward of Crkvina, in a depth of 15 fathoms (27^m4), mud ; and south-eastward of Tajan, in a depth of 18 fathoms (32^m9), gravel and shells.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 17 feet (5^m2) in height, on the landing pier at Luka Šipanska
15 (*Lat.* 42° 44' N., *Long.* 17° 52' E.).

Jakljan and Olipa.—Jakljan is easily identified ; its centre, 738 feet (224^m9) high, is a blanché, stony peak ; its southern side is rocky and precipitous. Jakljan is separated from Olipa by Veliki Vratnik,
page 202.

20 Veliki Vratnik should not be attempted by a sailing vessel with south-easterly winds or with the Bora ; calms and eddy currents, setting towards the shore, are of constant occurrence. It is occasionally used in north-westerly winds, and, if so, after passing Olipa, the vessel should be kept close hauled until beyond Tajan and certain
25 of weathering Mišjak, as the wind often heads as Zaliv Maestro opens out.

Olipa, the north-westernmost of the islands forming the south-western side of Koločepski kanal, is rocky and uncultivated. The summit, 692 feet (210^m9) high, is covered with bushes and its south-
30 western side is precipitous.

Olipa is separated from the mainland by Mali Vratnik, page 202. This entrance is too narrow to be considered easy for a sailing vessel even with a commanding breeze, though its steep, rocky shores are steep-to. See view facing this page.

35 *Chart 2713, plan of Port Slano.*

Slanska luka.—Light.—The entrance to Slanska (Slano) luka is described on page 202. The harbour is landlocked and is better protected from the Bora than any other anchorage in Koločepski kanal. It is sheltered from south-easterly winds ; the land breeze, which
40 generally blows at night, facilitates the departure of sailing vessels. The holding ground is mud and is generally good.

Osmine bay, on the western side within the entrance, should be avoided as the bottom is rocky.

Rt Donja is fringed by a shallow rocky bank, about half a cable
45 wide, and a similar bank fringes the south-eastern side of the entrance.

Banja bay is situated in the southern part of the eastern side of the harbour. The village of Slano, with a population of 1,075, in 1931, where there is a quay, with depths of 8 feet (2^m4) alongside, lies on the eastern side of the head of the harbour.

50 A light is exhibited, at an elevation of 15 feet (4^m6), from an iron column, 14 feet (4^m3) in height, on the quay at Slano (*Lat.* 42° 47' N., *Long.* 17° 53' E.).

Anchorage.—There is anchorage off the valley at the head of the harbour, in a depth of about 6 fathoms (11^m0), and, in a depth of

Charts 1440, 2158b.

Mt. Velja.

Mt. Veljara.

Mt. Tmor.



Marculat's point.

Rt Noŭice.

Olipa I.

Light Ho.

*Veliki Vratnik,
bearing 022°,
2 miles.*

Seka point.

*Kaine Sloje.
Jahjan.*

Veliki Vratnik.

(Original dated 1910.)

Chart 2713, plan of Port Slano.

about 12 fathoms (21^m9), half way between the head and the entrance, or, in a depth of about 16 fathoms (29^m3), westward of Gospa Luncijata, situated about half a mile southward of the light-structure on the quay at Slano. Banja bay, on the shore of which bollards are available, offers the best protection in a Bora. The muddy bottom off the village of Slano is not very tenacious.

Chart 2713.

Kanal Velikog Stona.—Dangers.—Beacons.—Kanal Velikog Stona (Ston Veliki) is an inlet in the south-eastern end of Poluotok Pelješac; its entrance is described on page 202. The channel narrows towards its head, where the small town of Ston is situated, whence the distance across the peninsula to Mali Ston is less than three-quarters of a mile. The steep sides of the channel are for the most part wooded. It is not often visited, being unhealthy, especially in summer; a vessel obliged to enter the channel by Veliki Vratnik, and unable to reach Zaliv Maestro might find temporary anchorage.

A rocky shoal, with a depth of 4½ fathoms (8^m7) over it, lies about a mile north-westward of Veljara point and 1½ cables off the south-western side of the channel; a similar shoal, with a depth of 5½ fathoms (10^m5) over it, lies about half a mile farther north-westward and 2 cables offshore.

About 3 miles north-westward of the entrance, the depths decrease rapidly, and in the fairway of the narrow portion there is a least depth of 1½ fathoms (2^m3).

The narrow part, at the north-western end of this channel is marked on the north-eastern side by black wooden beacons, each surmounted by a cone, and on the south-western side by red wooden beacons, each surmounted by a cylinder.

Small quantities of provisions can be obtained.

Lights.—A light is exhibited, at an elevation of 13 feet (4^m0), from an iron column, 12 feet (3^m7) in height, on the head of the mole at Broce, situated on the south-western side of the channel, about 3¼ miles north-westward of Veljara point (*Lat.* 42° 49' N., *Long.* 17° 43' E.).

A light is exhibited, at an elevation of 10 feet (3^m0), from a pyramidal pile structure on the same side of the channel about half a mile north-westward of Broce.

A light is exhibited, at an elevation of 10 feet (3^m0), from a pyramidal pile structure on the same side of the channel about 8 cables north-westward of Broce.

A light is exhibited, at an elevation of 11 feet (3^m4), from an iron column, 11 feet (3^m4) in height, on the molehead at Ston.

Anchorage.—Kanal Velikog Stona affords good anchorage under its north-eastern shore for a distance of about 3 miles from the entrance, at which position there is a depth of 10 fathoms (18^m3).

Small vessels can moor abreast the village of Kobaš (Kabas), on the south-western side about 2 miles north-westward of Veljara point; larger vessels can anchor northward of this village.

Directions for approaching Koločepski kanal.—Mount Tmor (*Lat.* 42° 50' N., *Long.* 17° 52' E.), which rises to an elevation of 2,950 feet (899^m2) over Zaliv Maestro, is a good mark for approaching the various passages into Koločepski kanal from westward; it opens well out north-westward of the chain of mountains in the interior,

Charts 1440, 2158a, 2158b.

Chart 2713.

and its bare rounded summit overtopping the surrounding land may be seen from a great distance. Lopud and then the other islands, will subsequently appear, and the choice of passage may then be determined according to the circumstances of wind and weather.

MLJET.—This island is the south-easternmost of the larger islands lying off this part of the coast, and lies with Rt Gruj, its south-eastern extremity, about $4\frac{1}{2}$ miles southward of Rt Nožice, page 202.

Mljet consists of a chain of wooded hills and a deep depression situated about one-third its length from its eastern end, and appears, from northward, like two groups of islets. Its summit, Mount Veliki Grad, 1,686 feet (513^m9) high, is near the centre; the northern side of the island is wooded and cultivated; the southern side is rocky and sterile, except towards the western end, where there is a pine forest. There are several villages, of which the principal is Babino Polje, on the southern slope of Mount Veliki Grad. See view A on chart 2713.

There are no secure anchorages off the southern coast, and it should not be approached too closely; the northern coast is easy of access and has one or two anchorages.

Southern side of Mljet.—Rt Gruj is the south-eastern termination of a peninsula, 491 feet (149^m7) high, which has a cove on either side. About $1\frac{1}{2}$ cables south-eastward of the point, there is a shoal, with a depth of 4 fathoms (7^m3) over it.

Along the southern coast of Mljet, the depths are considerable and there is no shelter, the whole coast being exposed to south-westerly winds and sea. Temporary anchorage in fine weather may be found in Luka Sablonara, on the western side of the peninsula just mentioned; and for a small vessel, in Uvala Gonoturska, near the entrance to Veliko Jezero, and about 4 miles from the western end of the island. Vessels approaching Luka Sablonara from westward should avoid a rocky patch, with a depth of 4 fathoms (7^m3) over it, lying 2 cables south-eastward of Rt Zaglava, situated about 2 miles westward of Rt Gruj.

Veliko Jezero abounds in fish, and is only approachable by boats through a narrow shallow channel.

A few rocks and islets lie off this coast, but none of them at a greater distance than half a mile; as there is nothing to be gained by nearing this coast it is better to give it a wide berth.

Chart 2712.

LAGOSTA GROUP.—This group of islands consists of Isola Lagosta, situated with Punta Noriga (Noriuhum), its eastern extremity, about 17 miles westward of Rt Goli, the western extremity of Mljet, and the islands and rocks lying eastward and westward of Isola Lagosta. Scoglio Glavato, the easternmost rock, lies $7\frac{1}{2}$ miles west-south-westward of Rt Goli (*Lat.* $42^{\circ} 47' N.$, *Long.* $17^{\circ} 19' E.$); Isola Cazza, the westernmost of the group, lies about 27 miles farther westward.

Isolotti Lagostini.—**Dangers.**—**Light.**—Isolotti Lagostini, lying eastward of Isola Lagosta, are divided into two groups, an eastern and a western. The eastern group consists of a number of islets, rocks, and shoals, forming a line of breakers. As the currents in the vicinity may be strong or irregular, and as the dangers are steep-to, it is advisable to give these islets a wide berth.

Charts 2713, 1440, 2158a, 2158b.

Chart 2712.

Scoglio Glavato is 72 feet (21^m9) high and bare ; it is steep-to except on the western side.

A light is exhibited, at an elevation of 150 feet (45^m7), from an octagonal stone tower on a dwelling, 84 feet (25^m6) in height, on Scoglio Glavato (*Lat.* 42° 46' N., *Long.* 17° 09' E.). Distress signals are displayed, *see* page 44.

Isolotti Vlasaizzi (Vlasnik), two islets close together, the higher of which is elevated 75 feet (22^m9), lie about 1½ miles westward of Scoglio Glavato, with Scoglio Merchinta (Markienda), 13 feet (4^m0) high and lying on a reef, nearly midway between. A 4-fathom (7^m3) patch lies about 3 cables north-eastward of Scoglio Merchinta ; between the latter and Isolotti Vlasaizzi there is a sunken rock with a 2½-fathom (4^m1) patch close north-eastward of it and a 4-fathom (7^m3) patch close north-westward of it.



Scoglio Glavato
lighthouse.

Isolotto Smoquizza (Smokvica), 75 feet (22^m9) high, lies close westward of Isolotti Vlasaizzi. A reef extends a short distance south-westward of Isolotto Smoquizza, and a 3½-fathom (6^m9) patch lies close off its north-western extremity.

Isolotto Merchinta (Markienda), 33 feet (10^m1) high, with a reef extending a short distance off its north-eastern side, lies about 4 cables west-south-westward of Isolotto Smoquizza.

Isolotti Le Sorelle (Sestrice), two islets close together, the higher of which is elevated 52 feet (15^m8), with Scoglio Brataz, 40 feet (12^m2) high, close south-westward, are situated at the western end of this group, about a mile west-south-westward of Isolotto Merchinta. A shoal, with a least depth of 2½ fathoms (5^m0) over it, lies about 4 cables north-eastward, and a 6-fathom (11^m0) patch, about 5 cables north-north-eastward, of Isolotti Le Sorelle, and Secca Annetta (Ankovica), with a depth of 4 fathoms (7^m3) over it, lies about three-quarters of a mile west-north-westward of the same islets. This is the westernmost danger of the eastern group of Isolotti Lagostini.

Scoglio Glavato light is obscured over all islets and dangers westward of it.

Between Isolotti Le Sorelle and Scoglio Merchinta Bianco (Markienda biela), the easternmost of the rocks of the western group of Isolotti Lagostini, about 2½ miles north-westward, there is a channel which, with the exception of Secca Annetta, is clear of danger, but the current is irregular and at times strong ; vessels from southward prefer passing between Scoglio Glavato and Mljet.

The western group of Isolotti Lagostini lies within a radius of about 3½ miles of Punta Noriga, and consists of the four principal islets of Crucizza (Krucica), Cesvinizza (Cesvenica), Stomorina and Miladine (Mladine), together with many smaller islets and rocks, ranging in height from a little above water to 272 feet (82^m9) ; the summits of the larger islets are covered with trees and bushes. There are many shoals in the vicinity of the islets, the positions of which can best be seen on the chart.

Scoglio Merchinta Bianco is 10 feet (3^m0) high and of a whitish colour ; Scoglio Merchinta Nero (Markienda), about three-quarters of

Charts 2713, 1440, 2158a, 2158b.

Chart 2712.

a mile north-westward, is 6 feet (1^m8) high and of a dark colour. These two rocks are not easily seen. A reef, with a depth of 1½ fathoms (2^m7) over it, extends a short distance south-westward of Scoglio 5 Merchinta Bianco. A detached reef, with depths of less than 6 feet (1^m8) over it, which is steep-to, lies from one to 2 cables north-westward of Scoglio Merchinta Nero; and a shoal, with a depth of 1½ fathoms (2^m7) over it, lies a short distance south-eastward of the same rock.

Secche Buscange, two detached shoals, the south-western, with a depth of 2 fathoms (3^m7) over it, and the other, about 1½ cables north-eastward, with a depth of 3½ fathoms (6^m9) over it, lie about 3½ cables north-westward of Scoglio Merchinta Nero.

Isolotto Taian (Tajan), 49 feet (14^m9) high, with a rock of the same name, 16 feet (4^m9) high, close westward of it, is the northernmost of 15 this group and lies about 1½ miles north-north-westward of Scoglio Merchinta Nero (*Lat.* 42° 48' N., *Long.* 17° 00' E.).

Isolotti Lucoviz (Lucovci) lie nearly midway between Punta Noriga and the northern extremity of Isolotto Stomorina, about 1½ miles north-eastward. Two shoals, each with a depth of 3½ fathoms (5^m9) 20 over it, lie a short distance southward of Isolotti Lucoviz and between those islets and Isolotto Stomorina there is a 3½-fathom (6^m9) patch.

Secche Drasan, consisting of a rock, awash, with a 4½-fathom (7^m8) patch about a cable north-westward, lie about 7 cables westward of Isolotti Lucoviz and 4 cables off the coast of Isola Lagosta. This is 25 the north-westernmost danger of this group.

Isolotto Petrovaz, the south-westernmost of the group, lies about three-quarters of a mile south-eastward of Punta Noriga. A sunken rock lies close off the south-western extremity of this islet and a similar rock lies about 2 cables off the south-eastern side of the islet.

30 In taking the channel between this group and the eastern end of Isola Lagosta, great caution is required.

Anchorage.—Vessels can obtain shelter from the Bora by anchoring under the lee of the larger islets. The best anchorage is southward of Isolotti Stomorina and Cesvinizza, where a vessel can secure to the 35 shore.

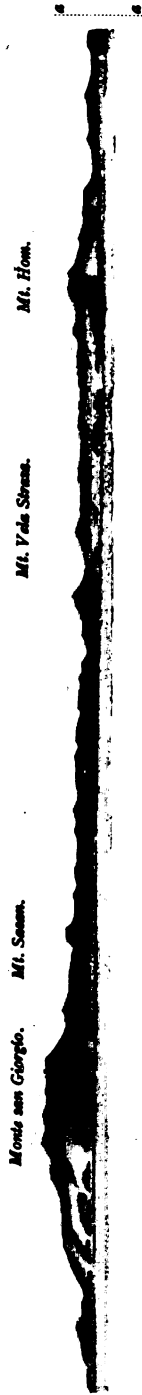
Isola Lagosta.—General description.—Monte San Giorgio (Hum), the summit of Isola Lagosta, 1,368 feet (417^m0), on which there is a chapel, stands near the centre of the island about 4 miles west-south-westward of Punta Noriga; the peak is covered with pine 40 trees. Monte Plessevo (Debelo Blezevo), 1,312 feet (399^m9) high, stands about half a mile south-westward of Monte San Giorgio. The other mountains in the island are wooded and cultivated. The coast is rocky and cliffy and, with the exception of the south-eastern side, is indented and steep-to, except for several rocky heads lying, in places, 45 as much as 3 cables offshore. *See* view facing this page.

In 1940, the population was 1,700. The village of Lagosta is situated on one of the highest hills on the northern side; there is a conical hill eastward of it, on which there is a signal station, and from which messages, received from ships, will be transmitted by telegraph.

50 **South-eastern and southern sides of Isola Lagosta.**—From Punta Noriga, which is steep-to, the coast trends about 3½ miles south-westward to Punta Scrigeva (Skrigeva), the south-western extremity of a promontory, and slopes steeply to the sea. Isolotto Barie, 36 feet (11^m0) high, lies on the outer end of a spit which extends 1½ cables

Charts 1440, 2158a, 2158b.

To face page 210.



Monte San Giorgio.

Mt. Sann.

Mt. Yala Shana.

Mt. Hom.

Punta Scrigena,
bearing 315°, 15 miles.
Isola Lagosta.

Mt. Norikun.

Otok
Korčula.
Isolotta M'udine.



Mt. Dobrovalha,
or Klupca.

Mt. Biebec.

Mt. Vipera.

Otok Korčula.

Scoglio Glasato.
Lighthouse
bearing about 003°.

View in 2 parts of Isola Lagosta and Otok Korčula.

(Original dated 1910.)

Chart 2712.

from the eastern side of Isola Lagosta, about half a mile southward of Punta Noriga ; this spit is steep-to. Southward of the spit, the depths are considerable close offshore.

Between Punta Scrigeva and Punta Svegliegamora, about $1\frac{1}{2}$ miles westward, there is a bay. A rocky shoal, with a depth of one fathom (1^m8) over it, lies about 6 cables east-north-eastward of Punta Svegliegamora, and two shoals, close together, each with a depth of $4\frac{1}{2}$ fathoms (8^m2) over it, lie about 2 cables farther north-eastward and 2 cables offshore. Valle Bruna (Mertevac) is situated on the western side of the bay about 4 cables northward of Punta Svegliegamora, with Scoglio Bruna lying, close offshore, on the northern side of its entrance.

Porto Rosso, the entrance to which is very narrow with a least depth of $3\frac{1}{2}$ fathoms (5^m9) in the fairway, lies on the eastern side of the bay, close northward of Punta Scrigeva.

Valle Usca is situated on the north-eastern side of the bay, about three-quarters of a mile north-north-westward of Punta Scrigeva. Scoglio Usca lies close off the eastern entrance point of this cove.

Lights.—A light is exhibited, at an elevation of 342 feet (106^m2), from a white circular stone tower on a dwelling, 56 feet (17^m1) in height, situated a short distance eastward of Punta Scrigeva (*Lat.* $42^\circ 43' N.$, *Long.* $16^\circ 53' E.$). See view on chart 2712.

A light is exhibited on the north-western entrance point of Porto Rosso.

Anchorage.—The bay between Punta Scrigeva and Punta Svegliegamora affords anchorage to vessels of the deepest draught, but is not safe and should only be resorted to in a Bora or during westerly winds; it is exposed to winds between south-west and south-east which cause a heavy sea. The only position which can be recommended as shelter in a gale, is in a depth of 18 fathoms (32^m9), under the lee of the high land of Punta Scrigeva, and in a Bora, between the entrance of Porto Rosso and Scoglio Usca.

Porto Rosso affords good shelter to small vessels with local knowledge. The bottom, consisting of mud covered with weed, is good holding ground. The small moles in the port are only accessible for boats.

Valle Usca is well sheltered from northerly winds, but southerly winds cause a heavy sea. Small vessels, with local knowledge, moor in the north-eastern part, in depths of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms (5^m0 to 5^m9), but this anchorage is dangerous in south-westerly winds.

A sailing vessel, when entering Porto Rosso with southerly or south-easterly winds, should be prepared for squalls from the high land. Punta Scrigeva may be rounded closely from eastward and Punta Svegliegamora from westward.

South-western and western sides of Isola Lagosta.—**Islets and dangers.**—Punta Nord San Pietro (Baske rat), the north-western extremity of San Pietro peninsula lies, about 2 miles north-westward of Punta Svegliegamora ; a shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, lies about a quarter of a mile west-north-westward of the latter point.

Valle Fonda (Duboka), open southward, but affording occasional shelter from the Bora, is situated about half a mile north-north-westward of Punta Svegliegamora.

Charts 1440, 2158a, 2158b.

Chart 1611, plan of Ports Lago Grande and Lago Piccolo.

Porto Lago Grande is entered between Punta Nord San Pietro and the south-eastern extremity of Isolotto San Giorgio, about 3 cables northward. A reef extends about half a cable north-westward from
 5 Punta San Nord Pietro; the south-eastern extremity of Isolotto San Giorgio in line with the south-eastern extremity of Isolotto San Raffaele, bearing 041°, leads north-westward of this reef.

Isolotto San Giorgio forms, with the western end of Isola Lagosta, Porto Lago Grande, on its south-eastern side and Porto Lago Piccolo,
 10 on its north-eastern side; the islet is 508 feet (154^m8) high, and is separated from Isola Lagosta by a very narrow boat channel, in which there is a depth of one foot (0^m3), and which connects the two above-mentioned harbours. The current in the boat channel between Isolotto San Giorgio and Isola Lagosta is strong.

15 Isolotto Bratino (Bratinottok), 262 feet (79^m9) high, of a whitish appearance and steep-to on the southern side, lies, with its eastern extremity, about 4 cables west-south-westward of Punta Nord San Pietro; a rocky bank, with depths of less than 5 fathoms (9^m1) over it, extends about half a cable from the north-eastern side of Isolotto
 20 Bratino. Isolotto Ullasseni, 295 feet (89^m9) high, lies 1½ cables westward of the southern end of Isolotto San Giorgio; a bank, with a depth of 4½ fathoms (8^m2) over it, extends about a cable south-westward of Isolotto Ullasseni. Both these islets are wooded.

The sides of Porto Lago Grande are steep and for the most part
 25 thickly overgrown; they are fringed by a narrow bank, with depths of less than 5 fathoms (9^m1) over it, in most places.

Isolotto San Raffaele, 82 feet (25^m0) high, covered with verdure and with a church on its north-eastern end, lies near the centre of the northern part of the harbour. This islet is surrounded by a bank, with
 30 depths of less than 5 fathoms (9^m1) over it, which is about half a cable wide.

Valle Cremena (Kremena) lies on the western side of the harbour, close northward of the south-eastern end of Isolotto San Giorgio, and Valle Giurgeva (Jurjeva) lies in the north-western corner. The sides of
 35 the former are cliffy and it is seldom visited; there is a mooring buoy in the latter. A vessel entering should pass southward of this buoy.

There is a conspicuous radio station in Valle Giurgeva; the building at the station is yellow with a red roof; near the building there is a small quay with landing steps.

40 Valle San Pietro, which is narrow and shallow, is situated in the south-eastern corner of Porto Lago Grande.

Light.—Light-buoy.—A light is exhibited, at an elevation of 59 feet (18^m0), from a circular concrete hut, 26 feet (7^m9) in height, on the south-eastern end of Isolotto San Giorgio (*Lat.* 42° 45' N., *Long.*
 45 16° 49' E.).

A light-buoy, exhibiting a *green flashing light every three seconds*, is moored on the northern edge of the reef extending from Punta Nord San Pietro.

Anchorages.—Large vessels can anchor either northward or south-
 50 ward of Isolotto San Raffaele, in depths of 16 or 26 fathoms (29^m3 or 47^m5), sand and shells; it was reported, in 1940, that greater depths exist in these localities than is indicated on the chart.

Small vessels can moor in the coves on the western side of Porto Lago Grande or in Valle San Pietro.

Charts 2712, 1440, 2158a, 2158b.

Chart 1611, plan of Ports Lago Grande and Lago Piccolo.

With south-easterly winds, squalls of great strength are experienced ; south-westerly winds cause a rough sea in the harbour. The bora blows from a northerly direction.

The currents are weak and variable in Porto Lago Grande.

Chart 2712.

Isolotto Cazzioi, page 214, Monte San Giorgio and Monte Plessevo, are good navigational marks from westward. Isolotto Bratino may be identified from a distance ; Punta Nord San Pietro may be distinguished by the large red patches on its southern side.

Both winds and currents are frequently irregular and strong between Isola Lagosta and the islets and rocks westward of it. See view D on chart 2712.

Regulations for the arrival and departure of aircraft.—Ten minutes before the arrival or departure of an aircraft at Porto Lago Grande or Porto Lago Piccolo, a prolonged blast on the siren is made to order the suspension of traffic.

When alighting or taking off is imminent, a red ball will be hoisted at the signal mast ; the ball will be lowered to indicate that the manœuvre is completed and that the water area is clear for traffic.

The whole of the water area of Porto Lago Grande and Porto Lago Piccolo is assigned for aerial navigation. This assignation, however, is limited to the periods of time established for the normal execution of the air services.

When the above-mentioned signal is sounded, vessels and other craft should :

(a) If in process of departing or entering, delay unmooring or entering.

(b) If already shifting berth, departing or arriving, should hasten the manœuvre, whilst the aircraft will delay its departure or arrival.

It is compulsory for all craft to leave a clear route for the aircraft, including all such craft as may be in the act of moving. Such craft should immediately repair to the nearest quay and await the signal denoting the end of the manœuvres. Vessels at anchor or moored to the quay, or which are waiting to move, should await the signal denoting the end of the manœuvre before commencing such movement.

Vessels arriving or departing, which are in the outer part, should manœuvre in such a manner that they do not obstruct the alighting or taking off of the aircraft.

All aircraft arriving outside the set times or on tourist service, may only use the areas of water assigned to aircraft when this is possible, alighting when such is not the case, in any other locality where the conditions of traffic permit them to do so with complete safety.

Charts 1611, plan of Ports Lago Grande and Lago Piccolo, 2712.

Off-lying islands westward of Isola Lagosta.—Isolotto Marchiara (Markiara) is separated from Isolotto San Giorgio, eastward, by a channel, about a cable wide ; Isolotti Ratogna (Rutenjaci), two in number, are situated on the shallow bank extending from the eastern side of Isolotto Marchiara in the northern part of the channel, named Valle Tamisa ; an isolated shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m) over it, lies in mid-channel, about $1\frac{1}{2}$ cables south-south-eastward of the southern of Isolotti Ratogna (Lat. $42^\circ 46' N.$, Long. $16^\circ 48' E.$).

Small vessels can anchor in Valle Tamisa, in a depth of 16 fathoms (29^m), under the western side of Isolotto San Giorgio.

Charts 1440, 2158a, 2158b.

Charts 1611, plan of Ports Lago Grande and Lago Piccolo, 2712.

Isolotto Marchiara is 397 feet (121^{m0}) high, and is composed of several small wooded hillocks ; its sides, especially the south-western, are steep.

5 *Chart 2712.*

About three-quarters of a mile westward of the southern part of Isolotto Marchiara and in mid-channel, there is an isolated rock, with a depth of 5½ fathoms (10^{m5}) over it, which is steep-to.

Isolotto Marchiara Piccolo (Pod Markiara), 52 feet (15^{m8}) high, lies 10 about half a mile off the north-western side of Isolotto Marchiara ; a shoal, with a depth of 2½ fathoms (5^{m0}) over it, lies close off the north-western side of Isolotto Marchiara Piccolo (*Lat.* 42° 47' N., *Long.* 16° 46' E.).

Isolotto Nero (Cernac), a rugged, rocky islet, 46 feet (14^{m0}) high, 15 with an above-water rock close off its eastern end, lies about 2 miles westward of the southern extremity of Isolotto Marchiara ; there is a 9-fathom (16^{m5}) patch a quarter of a mile north-eastward, and an 8-fathom (14^{m6}) patch one mile north-north-eastward of Isolotto Nero.

Isolotto Cazziol, 305 feet (93^{m0}) high, lies, with its eastern extremity, 20 about half a mile west-south-westward of Isolotto Nero ; it is uninhabited and has a hillock on it which is covered with bushes. The coast is cliffy and generally steep-to. Depths of 5 fathoms (9^{m1}) extend a short distance from the south-western extremity of the islet and an above-water rock lies close off its northern extremity ; the 25 south-eastern side is the best for landing.

Valle Cazziol (Lenard cove), with a sandy bottom, is situated on the northern side of the islet and affords good shelter with southerly winds ; an inlet on the south-western side of this small bay is well protected from winds between south-east and north-west. A sunken 30 rock lies close off the western entrance point.

The current between Isolotto Cazziol and Isolotto Marchiara is rapid.

A rocky shoal, with a depth of 2 fathoms (3^{m7}) over it, lies about 4 cables off the south-western end of Isolotto Cazziol.

Isolotto Luccovaz (Pod Kopiste), 98 feet (29^{m9}) high, thinly over- 35 grown, and steep-to, lies a quarter of a mile northward of Isolotto Cazziol.

Isolotto Bianco (Bielaz) is 52 feet (15^{m8}) high, with light-coloured vertical sides, and steep-to ; it lies about 1½ miles west-north-westward of Punta Cazziol (Kopiste), the western extremity of Isolotto Cazziol ; 40 there is a 10-fathom (18^{m3}) patch about 3 cables eastward of this islet.

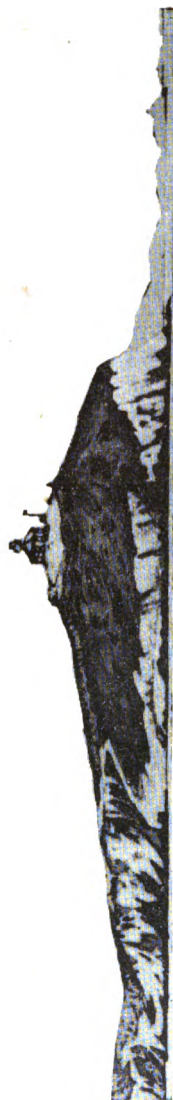
Isola Cazza.—This island is the westernmost of the Lagosta group and lies with Punta Vaglia (Valja), its eastern extremity, about 6½ miles west-north-westward of Isolotto Bianco.

Isola Cazza is 797 feet (242^{m9}) high ; the south-western and north- 45 eastern parts of the island are separated by low land, and from a distance it appears as two islets. Its sides are mostly cliffy and are steep-to, and are partly wooded. There are a few inhabitants.

On the south-eastern side of Isola Cazza there are some coves in which small vessels, with local knowledge, can find shelter from north- 50 easterly and north-westerly winds, but these anchorages are not safe ; a vessel caught in the Bora off the island should, if possible, make for Otok Vis, about 20 miles north-north-westward, or failing to do so, make for Golfo di Manfredonia, about 70 miles south-south-westward.

Charts 1440, 2158a, 2158b.

To face page 215.



*Lighthouse
on Lagosta.*

Isola Cazza lighthouse, bearing 090°, distant 2 miles.

(Original dated 1910.)

Chart 2712.

Valle Porto (Porat), situated on the south-eastern side of the island, about three-quarters of a mile north-eastward of Punta Triscavaz, its south-western extremity, has a sandy bottom, with good holding ground. Here there is a village and two small landing piers for fishing 5 boats.

Light.—Signal station.—A light is exhibited, at an elevation of 308 feet (93^m9), from a square tower on a dwelling, painted in red and white stripes, 66 feet (20^m1) in height, situated close northward of Punta Triscavaz, Isola Cazza (*Lat.* 42° 45' N., *Long.* 16° 29' E.). See 10 view facing this page.

There is a signal station at the lighthouse and distress signals are displayed. See page 44.

Chart 2713.

MLJETSKI KANAL.—General description.—Mljetski (Mljet) 15 kanal lies between Mljet and Poluotok Pelješac; the channel is entered from south-eastward between Rt Gruj and Rt Nožice. The ordinary west-going current sets through the channel, except in winter, during easterly winds, when the direction is generally west-north-westerly. Southerly and south-easterly winds cause a heavy sea, especially on 20 the north-eastern side; during these winds this side should be avoided by a sailing vessel as they seldom blow home. With the Bora, a vessel should keep near the north-eastern side.

The north-eastern side of the channel, between Rt Nožice and Provizda (Prejizdra) point, about 16 miles west-north-westward, is 25 high and of a whitish aspect, with scattered patches of brushwood, and is backed by high land, the mountains rising immediately above it. Mount Čarević, 2,070 feet (630^m9) high, stands about 5 miles east-south-eastward of Provizda point and a mile inland. The land is almost uninhabited, without any good anchorage and subject to sudden 30 north-easterly squalls, especially towards the close of day.

About 5 miles north-westward of Mount Čarević, Poluotok Pelješac narrows and there is a remarkable depression in the land, which has a desolate, dry and burnt appearance and is visible from a great distance 35 seaward.

On the south-western side of the channel, the coast of Mljet is easy of access and has one or two anchorages. See view facing 35 page 216.

Telegraph cable.—A submarine cable, indicated on the chart, is laid across Mljetski kanal about 6 miles north-westward of its south- 40 eastern entrance.

Channel.—On the south-western side of Mljetski kanal, Uvala Podškoci lies between a light-coloured, bare islet, 65 feet (19^m8) high, situated about a mile northward of Rt Gruj, and close off the eastern end of Mljet to which it is connected by a shallow ridge, on which 45 there is an above-water rock.

Uvala Okuklje lies at the head of an indentation between Stoba and Maharci points, 3 and 4 miles, respectively farther west-north-westward.

A shoal, with a depth of 2½ fathoms (4^m6) over it, lies close off the 50 eastern side of Maharci point.

Uvala Prožura, about three-quarters of a mile westward of Maharci point, is partially protected northward by three islets, of which

Chart 2713.

Borovac, 85 feet (25^m9) high, the northernmost, with a sunken rock close off its north-western end, lies about a quarter of a mile offshore.

These coves are suitable only for small vessels, with local knowledge.

Galičak, an islet, 89 feet (27^m1) high, lies close offshore about half a mile westward of Borovac.

Luka Sobra, page 217, is entered between Rt Pusta, about 2½ miles westward of Maharci point, and a point about half a mile south-eastward; Badanj, an islet, lies close off this point. Supenak, a low, above-water rock, lies on a reef which extends more than a cable north-eastward of Rt Pusta (*Lat. 42° 45' N., Long. 17° 37' E.*). See view facing this page.

On the north-eastern side of the channel, Pristanište Prapatna is situated about 5 miles north-westward of Rt Nožice; small vessels can anchor here and secure to the shore. Between Rt Nožice and Provizda point, the coast is steep-to, with the exception of a 1½-fathom (3^m2) patch, lying about 3 cables southward of the latter point and 1½ cables offshore.

Otočić Lirica lies about 2 cables westward of Provizda point, connected to it by a shallow bank.

On the south-western side of the channel, Rt Križine lies about 7½ miles west-north-westward of Rt Pusta, the intervening coast being steep-to and affording no shelter, except at Kozarica cove, situated about 1½ miles east-south-eastward of Rt Križine. A breakwater extends from the eastern side of this cove which affords shelter to small vessels, with local knowledge.

Chart 2713, plan of Polače harbour.

Luka Polače, page 218, is entered between Rt Križine and Rt Stupe about 2 miles west-north-westward. A shallow bank extends a quarter of a cable eastward of Rt Stupe.

The entrance to this harbour is occupied by several rocky islets, the principal of which are Kobrave, Ovrat, Moračnik and Tajnik, the innermost.

Kobrave, the largest and easternmost of these islets, lies parallel with the coast, with a narrow sheltered channel between; the islet has two hills, each 230 feet (70^m1) high, and 6 cables apart, with a deep saddle between.

Otočić Kula lies 1½ cables east-south-eastward of the eastern end of Kobrave, near the middle of the eastern entrance of the channel just mentioned.

Ovrat, which is bare and has steep sides, is 105 feet (32^m0) high and lies about 1½ cables northward of the western end of Kobrave. A shoal, with a depth of 3 fathoms (5^m5) over it, extends about a cable off the eastern end of Ovrat and a shoal, with a depth of 2 fathoms (3^m7) over it, extends about half a cable from its western end.

Moračnik, 331 feet (100^m9) high, lies with its eastern extremity about a cable south-westward of the western extremity of Ovrat. A shoal, with a depth of half a fathom (0^m9) over it, extends a short distance off the south-eastern extremity of Moračnik; and an above-water rock, with a reef extending half a cable from its western side, lies about a cable westward of the northern extremity of the islet (*Lat. 42° 48' N., Long. 17° 24' E.*).

Zaliv Stupe lies between a point, about three-quarters of a mile west-

Charts 1440, 2185a, 2158b.

To face page 216.

Gradac.

Planjak.

Olipa I.



Jakljan.

Ri Grui,
bearing 022°

Eastern end of Mljet, distant 10 miles.
(Original dated 1910.)

Blaska Gora.

Mali Grad.

Veliki Grad.



Galičak.

Badanj.

Entrance.

Ri Pusta Li. Ho., bearing 252°, 1½ miles,
Suprenak rock.

Luka Sobra.
(Original dated 1910.)

Chart 2713, plan of Polače harbour.

north-westward of Rt Stupe, and a point about 4 cables further west-north-westward.

Danger.—A sunken rock, which breaks, lies about $1\frac{1}{2}$ cables northward of the eastern entrance point of Zaliv Stupe. 5

Chart 2713.

Channel.—Between the western entrance point of Zaliv Stupe and Rt Goli, the western extremity of Mljet, the coast is indented and fringed with islets and sunken rocks, the latter being near the coast and mostly southward and south-eastward of Otočić Glavat, 150 feet 10 (45^m7) high, and steep-to, lying about 2 miles north-eastward of Rt Goli and 2 cables offshore.

Chart 2713, plan of Port Pomena.

Otočić Pomeštak lies with its south-western extremity about a mile east-north-eastward of Rt Goli, and is connected to the coast south-eastward by a bank, with a depth of 3 fathoms (5^m5) over it. This islet is 148 feet (45^m1) high, whitish at the base, and covered with brushwood to its summit. Galicija, a greyish coloured islet, lies close off the south-western extremity of Otočić Pomeštak, connected to it by a shallow ridge. 20

Luka Pomena, page 219, is entered between Galicija and a point about $2\frac{1}{2}$ cables westward. Crna Seka, an islet, which is greyish coloured and surrounded by a shallow bank which extends about three-quarters of a cable north-eastward and south-westward of it, lies in the approach to Luka Pomena, about 2 cables north-eastward 25 of its western entrance point.

Si, an islet, with a sunken rock close off its north-eastern end and surrounded by foul ground, lies about $2\frac{1}{2}$ cables north-north-eastward of Rt Goli and a cable offshore.

Rt Goli is the western extremity of an indented projection, 154 feet 30 (46^m9) high, which is conspicuous.

Chart 2713.

On the north-eastern side of Mljetski kanal, Žuljanski (Žuljana) zaliv, page 219, is entered between Provizda point and a point about $3\frac{1}{4}$ miles north-westward. Hrid Dingač lies close eastward of the 35 latter point and close offshore. The conspicuous valley at the head of this bay has already been mentioned. Mljetski kanal is entered from westward between Hrid Dingač and Rt Goli.

Lights.—A light is exhibited, at an elevation of 47 feet (14^m3), from an iron column, 31 feet (9^m4) in height, on Rt Pusta (Lat. 42° 40 45' N., Long. 17° 37' E.).

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron column, 13 feet (4^m0) in height, on Otočić Kula.

A light is exhibited, at an elevation of 112 feet (34^m1), from a circular tower on a hexagonal stone base, 45 feet (13^m7) in height, on 45 Otočić Lirica.

Luka Sobra.—Anchorages.—This harbour consists of two bays and is a convenient anchorage for windbound vessels, but it is only used in case of necessity by large vessels, on account of the nature of the bottom which, in the middle of the harbour, is rocky and in other parts only 50 covered by a thin layer of mud or sand. A point on the south-western side of the harbour is fringed by a reef and a sunken rock lies close off the northern shore of the western bay. About 3 cables westward of Badanj, there is a rocky bank, with a depth of 6 fathoms (11^m0) over

Charts 1440, 2158a, 2158b.

Chart 2713.

it, which should be avoided when taking up a berth between the two bays. The shores are backed by well-wooded hills. *See* view facing page 216.

- 5 The anchorage for vessels of deep draught is in a depth of 35 fathoms (64^m0), sand, in the western bay. The northern side, where there are depths of from 16 to 27 fathoms (29^m3 to 49^m4), sand, should be preferred, being the best sheltered from winds from that quarter. Small vessels can anchor in the eastern part of the harbour in Zaglavac bay.
- 10 The position of Luka Sobra is easily distinguished, being near the depression in Mljet already mentioned.

Chart 2713, plan of Polače harbour.

- Luka Polače.—Anchorages.**—Between the islets fronting Luka Polače and the coast, there are four passages into the harbour, in
- 15 which, as well as in the harbour itself, there are several good anchorages. The harbour is considered one of the best in the islands off this part of the Adriatic shore, but its space is limited and the islets at the entrance render access somewhat difficult in a sailing vessel, but, according to the wind, one or more of the entrance channels are always
- 20 available.

The harbour is westward of the western islets, with Rogac cove, an almost landlocked basin, at its head. A shallow reef extends from the south-western side of the harbour, about 3 cables from its head.

- In the south-western part of the harbour, there is a quay, which can
- 25 only be approached by vessels of shallow draught, and a small jetty, with a depth of about 2½ fathoms (5^m0) at its head. There are some houses in the neighbourhood of the quay.

- The most sheltered anchorage is abreast some ruins on the south-western shore, as indicated on the chart, about 2½ cables north-east-
- 30 ward of Polače, in depths of from 7 to 12 fathoms (12^m8 to 21^m9), mud. Vessels can also anchor between the islets and the shore eastward of the narrowest part of the harbour, in a depth of 19 fathoms (34^m7).

- The anchorage most frequented for temporary purposes is between Kobrave and the coast of Mljet, about 7 cables westward of Otočić
- 35 Kula, in depths of from 17 to 23 fathoms (31^m0 to 42^m1), sand and mud; a better berth is farther westward, in a depth of 19 fathoms (34^m7), between the western end of Kobrave and Tajnik.

- In making for Luka Polače, Rt Goli (*Lat.* 42° 47' N., *Long.* 17° 19' E.) will readily be identified; the land is thickly wooded, and
- 40 the four rocky islets present a barren whitish aspect. In southerly winds a vessel should be prepared for heavy squalls in the narrow passages.

- A large vessel should steer along the southern coast of Kobrave into the harbour, passing northward of Otočić Kula, this channel being
- 45 wider and having greater depths than that southward.

- In taking the western passage between Rt Stupe and Moračnik, the north-western shore should be closed in order to avoid the reef near Moračnik; but only small vessels should use this passage, as a shallow bank extends from the south-western extremity of Moračnik,
- 50 and a similar bank from a point on the coast westward, contracting the navigable channel very considerably.

A mid-channel course should be followed in the other passages, the extremities of the islets being foul, especially those of Moračnik and Ovrat.

Charts 1440, 2158a, 2158b.

Chart 2713, plan of Port Poma.

Luka Pomena.—Anchorages.—Luka Pomena (Poma), the entrance to which is described on page 217, is sheltered by the projection of which Rt Goli (*Lat. 42° 47' N., Long. 17° 19' E.*) is the western termination. The harbour, which has two arms, a southern and an eastern, is formed by this projection and the coast eastward of it, and affords anchorages for small vessels. It is sheltered northward and north-eastward by Galicija and Otočić Pomeštak. 5

Vessels can anchor southward of Otočić Pomeštak, in depths of from 16 to 21 fathoms (29^m3 to 38^m4), and make fast to it; and, in the southern arm at about 3 cables from its head, in a depth of about 12 fathoms (21^m9), sand and mud. 10

The approach to the harbour from north-westward is between Crna Seka and the northern extremity of the projection south-westward. This passage is about a cable wide between the shoals extending from either side, with considerable depths in the fairway. The passage leading from north-eastward, between Crna Seka and Galicija, is 1½ cables wide and deep, but to enter the harbour from it involves a turn of over 90°. 15

Chart 2713.

Žuljanski zaliv.—Danger.—Lights.—The entrance to Žuljanski zaliv is described on page 217. The high land on the northern side of the bay slopes abruptly to a conspicuous valley. Within the bay, the depths are considerable, except for one sunken rock, about 2 cables westward of the northern of two flat, above-water rocks lying close off the north-eastern entrance point of Vučine cove, situated in the south-eastern part of the bay. The village of Žuljana lies at the head of a small bay close northward of Vučine cove; a short mole extends northward from the western end of the quay on the southern side of this small bay. Small craft, with local knowledge, can secure to the inner side of the mole. 20 30

Luka Trstenik is situated in the north-western corner of Žuljanski zaliv; a 6-fathom (11^m0) patch lies in the entrance of this small harbour. A point, near which there is a small church, projects from the north-eastern side of this harbour and Zaglavak point, a small rocky peninsula, projects from the coast, about 6 cables south-eastward of the head of the harbour. A mole extends 328 feet (100^m0) eastward from the southern end of the quay on the western side of Luka Trstenik; small vessels, with local knowledge, can secure alongside either the mole or quay, where there are depths of about 13 feet (4^m0). 35 40

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron framework structure, 15 feet (4^m6) in height, on the head of the mole at Žuljana.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 15 feet (4^m6) in height, on the head of the mole at Luka Trstenik. 45

Anchorages.—Luka Trstenik is resorted to by vessels, with local knowledge, in summer, the only time when it can be considered safe; these vessels anchor at the entrance, in a depth of 16 fathoms (29^m3), and lay out cables to the shores eastward and westward, against the violent gusts of the Bora from the valley at the head of Žuljanski zaliv. Here they are partially protected eastward by Zaglavak point and are well sheltered from westerly winds; southerly winds, how- 50

Charts 2713, 1440, 2158a, 2158b.

Chart 2713.

ever, send in a considerable sea. The ordinary anchorage is westward of the point with a church near it, abreast some stone houses on the beach.

5 Charts 2713, 2712.

- OTOK KORČULA.**—This island lies with Rt Ražnjić, its eastern extremity, about $7\frac{1}{4}$ miles westward of Hrid Dingač; it is one of the most important islands off the coast of Yugoslavia. A chain of tree-covered mountains extends from one end of the island to the other.
- 10* Mount Klupca (Dobrovačka), 1,863 feet (567^m8) high, about 8 miles westward of Rt Ražnjić, presents a conical or forked summit according to the direction from which it is viewed.

- The coasts, generally, are steep-to. The anchorages at the western end are convenient for vessels navigating along the eastern shore of the
- 15* Adriatic, especially when overtaken by heavy southerly winds.

LASTOVSKI KANAL.—General description.—Lastovski (Lagosta) kanal is a continuation westward of Mljetski kanal and lies between the Lagosta group, on its southern side, and Korčula on its northern side.

- 20* The ordinary west-going current sets through Lastovski kanal and, when this is accelerated by easterly winds, eddies are caused at the western entrance. With a southerly wind, a sailing vessel should approach the coast of Korčula in order to be in a position to seek, if necessary, one of the anchorages at its western end, but as there are
- 25* no anchorages in the eastern part of the channel caution is necessary to guard against a sudden fall of wind which may be accompanied by an increasing sea.

- In winter the Bora blows heavily in this channel, and it is prudent to endeavour to reach Porto Rosso in Isola Lagosta, or some other shelter,
- 30* at the first symptoms of its approach, in order to avoid the necessity of bearing up for Golfo di Manfredonia on the Italian coast or of lying-to under the lee of the island.

- Coast.**—On the northern side of the eastern end of Lastovski kanal, between Hrid Dingač, page 217, and a point about $6\frac{1}{2}$ miles west-
- 35* north-westward, the coast is steep-to, with the exception of a few small shallow banks which extend a short distance offshore.

Chart 1611, plan of Peljesac channel.

- Pelješački kanal, page 226, is entered from south-eastward between the last mentioned point, which forms the western side of Uvala
- 40* Lučica, and Rt Ražnjić (*Lat.* 42° 55' N., *Long.* 17° 12' E.), about $3\frac{1}{4}$ miles south-westward. Rt Ražnjić is the termination of a small peninsula, 13 feet (4^m0) high, projecting a short distance from the eastern end of Korčula. The land immediately westward of the point rises to a hill, 270 feet (82^m3) high and mostly covered with brush-
- 45* wood; it is bordered by rugged whitish rocks. A spit, with a depth of 2 fathoms (3^m7) over it, and steep-to, extends about half a cable south-eastward from Rt Ražnjić. See view A on chart 1611, and view facing page 210.

Charts 2713, 2712.

- 50* The southern side of Korčula, between Rt Ražnjić and Veli Zaglav point, about $15\frac{1}{4}$ miles westward, is rocky and steep-to, sparsely inhabited and thinly wooded; with the exception of a few coves avail-

Charts 1440, 2158a.

Charts 2713, 2712.

able for small vessels, with local knowledge, with offshore winds, it is without a place of shelter.

Chart 2712.

On the southern side of Lastovski kanal, Isolotti Lagostini are described on pages from 208 to 210. Isolotto Taian lies 6 miles from the southern coast of Korčula; Scoglio Glavato light is obscured over this islet and a vessel using the channel should pass northward of it.

The northern side of Isola Lagosta is indented by bays and coves, nearly all of which are exposed to northerly winds. Secche Drasan, lying about three-quarters of a mile north-westward of Punta Noriga and 4 cables offshore, are described on page 210. A patch, with a depth of 10 fathoms (18^m3) over it, lies about 1½ miles west-north-westward of Punta Noriga and half a mile offshore.

Isolotto San Michele, 20 feet (6^m1) high, lies about 2 miles westward of Punta Noriga. This islet is connected to the coast east-south-eastward by a narrow, shallow bank, forming a small basin which affords shelter to small vessels against south-westerly winds. There is a quay which, in 1940, was being extended, on the western side of Isolotto San Michele (*Lat. 42° 46' N., Long. 16° 54' E.*).

Valle Magazzini (Suciza), about 2 cables eastward of Isolotto San Michele, is the harbour of the village of Lagosta, page 210, which is partly visible from seaward; there are depths of 3½ fathoms (5^m9) in the entrance to the cove and 1½ fathoms (2^m3) within, near the centre, rapidly decreasing towards its head. Small vessels, with local knowledge, can lie alongside the quay on the western side of the cove, but the anchorage is indifferent and the bottom is not good holding ground.

Porto Chiave, about three-quarters of a mile westward of Isolotto San Michele, is well protected by Isolotto Chiave, 131 feet (39^m9) high, situated close off its western entrance point. For anchorage, see page 223.

Valle Coritta (Korita) and Valle Crucizza (Krusica) are entered about one mile and 2 miles, respectively, westward of Isolotto San Michele.

Chart 1611, plan of Ports Lago Grande and Lago Piccolo.

Porto Lago Piccolo is an indentation at the north-western end of Isola Lagosta; it is protected westward by the northern part of Isolotto San Giorgio, and by Isolotto Maslegna (Maslenjak veliki), 105 feet (32^m0) high, and covered with bushes, close off its north-eastern extremity. The north-easternmost of a chain of islets and above-water rocks, extending from Isolotto San Giorgio, lies about three-quarters of a cable west-north-westward of the western extremity of Isolotto Maslenga.

The entrance into the port, between Isolotto Maslenga and Punta Pricodiscia (Prihodisce), the north-western extremity of Isola Lagosta, south-eastward, is clear and deep, 1½ cables wide, and leads to a land-locked anchorage, page 224. Punta Pricodiscia rises close within to a height of 223 feet (68^m0) and is cone-shaped the land immediately south-eastward of it slopes to a height of 12 feet (3^m7) and rises again to 237 feet (72^m2), causing the point, from a distance, to appear as an island. The salient points within the entrance have shallow spits extending a short distance from them, narrowing the entrance to the harbour to about one cable.

Charts 1440, 2158a, 2158b.

Chart 1611, plan of Ports Lago Grande and Lago Piccolo.

Isolotto San Giorgio and the islets westward of it are described on pages from 212 to 214.

Light.—A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron structure, 15 feet (4^m6) in height, on the quay at Isolotto San Michele.

Chart 1611, plan of Port Karbun, Port Prižba and Brna harbour.

Channel.—**Light.**—On the northern side of Lastovski kanal, from Veli Zaglav point, the southern side of Korčula trends about 4 miles westward and 2 miles west-north-westward to Zaglav point. The chapel of Sveti Marko stands, at an elevation of 636 feet (193^m8), about 1½ miles west-north-westward of Veli Zaglav point, and the village of Prižba lies near the shore about 1½ miles farther westward. Morkan, a mountain, 1,207 feet (367^m9) high, is situated about three-quarters of a mile north-westward of Sveti Marko chapel, and Mount Kula, 1,037 feet (316^m1) high, stands about 3½ miles farther westward and half a mile inland. A chain of islets, rocks and shoals lies a short distance off this stretch of coast. Small vessels can find excellent shelter between these islets and the shore.

Veli Zaglav point is 240 feet (73^m2) high and well wooded; a rocky 3-fathom (5^m5) patch lies about 1½ cables westward of this point.

Brna luka, with two narrow arms, separated by Rt Mali Zaglav, at its head, is entered between Veli Zaglav point and Vinačac point, about half a mile west-north-westward. For anchorage, *see* page 224.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 15 feet (4^m6) in height, on Rt Mali Zaglav (*Lat.* 42° 54' N., *Long.* 16° 51' E.).

Otočac, an islet, 75 feet (22^m9) high and connected to the coast by a narrow, shallow ridge, lies close westward of Vinačac point.

Between Otočac and the eastern extremity of Vrhovnjak, an islet, 102 feet (31^m1) high, about half a mile south-westward, is the eastern entrance to a channel about 4 cables wide and 2 miles long, which forms Luka Prižba, affording good anchorage, page 224. Sveti Marko chapel marks this entrance. Four islets, Vrhovnjak, Srednjak (Sridnjak), Crklica (Crklina), and Stupa, the westernmost, which is 87 feet (26^m5) high, form the southern side of this port. These islets, when seen from a distance, present a low whitish line, standing out in relief from the dark ground of Korčula. A vessel should not pass between the islets, the passages being very narrow and shallow, and the current strong. There are shallow rocky patches, with depths of 4 and 4½ fathoms (7^m3 and 8^m2) over them, the position of which can best be seen on the chart, a short distance within the eastern entrance.

The western entrance to this port is between Stupa and Kosor, an islet, 72 feet (21^m9) high, about a mile west-north-westward. There is an above-water rock close off the northern end of Kosor, which lies about a cable off the coast of Korčula northward.

A 3-fathom (5^m5) patch lies about 1½ cables west-north-westward of the western extremity of Stupa and a 1½-fathom (3^m2) patch, about a cable eastward of the south-eastern extremity of Kosor.

Cirinjak, a rock, 6 feet (1^m8) high, lies about 4 cables north-north-eastward of the eastern extremity of Stupa and 1½ cables off Prižba point, situated on Korčula north-north-eastward. A 2½-fathom (5^m0) patch, rock, lies nearly midway between Cirinjak and the south-western end of Crklica.

Charts 2712, 1440, 2158a, 2158b.

Chart 1611, plan of Port Karbun, Port Prižba and Brna harbour.

Sveti Marko chapel in line with Cirinjak, bearing 073°, leads through the western entrance. Cirinjak can be passed on either side.

Gerščica (Grščica) cove lies on the northern side of the western end of the port, and is partly sheltered by Kosor. 5

The position of Luka Prižba can be identified by Mount Morkan.

Objak, an islet, 150 feet (45^m7) high, sugar-loaf shaped and covered with bushes, lies about 4 cables westward of the northern end of Kosor and 2 cables off the coast of Korčula; Dubrovnjak, an islet, 23 feet (7^m0) high, lies nearly midway between these two islets. 10

The eastern entrance of Port Karbun lies between Objak and the south-eastern extremity of Zvirinović, the largest and westernmost of the chain of islets lying off this part of Korčula, about 4 cables west-north-westward.

Zvirinović is wooded, and, at a distance, appears as two islets, having 15 two peaks, 216 and 199 feet (65^m8 and 60^m7) high, respectively. Port Karbun is situated between this islet and Korčula.

There is a 4½-fathom (8^m2) patch in the eastern entrance, about 1½ cables west-north-westward of Objak. Gubesa, an islet, 51 feet (15^m5) high, lies about 1½ cables north-north-eastward of the south-eastern extremity of Zvirinović. 20

The western entrance of Port Karbun lies between the north-western extremity of Zvirinović and Zaglav point, about 3½ cables north-westward; this point is 155 feet (47^m2) high and projects 3 cables south-eastward. 25

Zaglav cove is situated, at the north-western end of Port Karbun, on the north-eastern side of Zaglav point (*Lat.* 42° 55' N., *Long.* 16° 43' E.).

For anchorage, *see* page 224.

Chart 2712.

Between Zaglav point and Rt Ključ, about 2 miles westward, there is a bight; Uvala Triluka, an inlet in which there are three creeks, is situated at the north-western end of the bight. 30

Extending 2 miles south-eastward of Rt Ključ there are four islets; Trstenik, the nearest and largest, is 65 feet (19^m8) high; between it and the point a clear, deep channel leads into Uvala Triluka. The second and third islets are joined by a flat, with a depth of 2 fathoms (3^m7) over it; they are called Pržnjak, the north-western is 82 feet (25^m0) high, and the south-eastern, 85 feet (25^m9) high, the latter has a sunken rock close off its northern point. Between Trstenik and the second islet, the channel is clear and deep. Lukovac, the outer and smallest islet, is 55 feet (16^m7) high; Hrid Gredica, 6 feet (1^m8) high, lies in mid-channel in the inner part of the passage between Lukovac and the south-eastern of Otočići Pržnjak, about 2 cables eastward of the latter. These four islets shelter Uvala Triluka from the sea. 45

Lastovski kanal is entered from westward between Rt Velo Danče, about 1½ miles north-westward of Rt Ključ, and Isola Cazza, about 10½ miles south-westward.

Anchorage in Lastovski kanal.—On the southern side of Lastovski kanal, small vessels, with local knowledge, can anchor near the middle of Porto Chiave, page 221, in a depth of 5 or 6 fathoms (9^m1 or 11^m0), mud, and a hawser taken to the islet. In this position, only northerly and north-easterly winds are much felt. The channel

Charts 2712, 1440, 2158a.

Chart 2712.

into the port, in the fairway of which there is a depth of $3\frac{1}{2}$ fathoms (5^m9), is on the eastern side of Isolotto Chiave and there is also a passage, with a depth of 3 feet (0^m9) between the islet and the coast westward.

Valle Coritta and Valle Crucizza, page 221, which should not be entered without local knowledge, are only suitable for anchorage with southerly winds and are dangerous in the Bora. The most convenient anchorage in the latter is in its innermost corner.

10 *Chart 1611, plan of Porto Lago Grande and Lago Piccolo.*

Large vessels can anchor in Porto Lago Piccolo, page 221, southward of the summit of Punta Pricodiscia in a depth of about 20 fathoms (36^m6); in 1940, the depths were reported to be considerably greater than those indicated on the chart. Small vessels can anchor in the arm leading to the boat passage connecting Porto Lago Piccolo with Porto Lago Grande, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), where there is good shelter from the Bora, but it is difficult of ingress or egress in a sailing vessel. The bottom in the anchorage is rocky and bad holding ground.

20 For regulations with regard to aircraft, see page 213.

Chart 1611, plan of Port Karbun, Port Prižba and Brna harbour.

On the northern side of Lastovski kanal, Brna luka, page 222, affords good anchorage for vessels of shallow draught in depths of from 3 to 5 fathoms (5^m5 to 9^m1), sand, at the head of the eastern arm; cables are generally laid out to the shore against the Bora. Larger vessels can anchor farther out in a depth of 20 fathoms (36^m6).

In Luka Prižba, page 222, the best anchorage is in depths of from 17 to 18 fathoms (31^m1 to 32^m9), northward of Srednjak, with Cirinjak (Lat. $42^\circ 54' N.$, Long. $16^\circ 47' E.$) in line with the middle of Kosor, bearing about 270° .

Gerščica cove affords good shelter in any weather to small vessels, with local knowledge, moored within a sunken reef extending from the eastern shore at its head; small vessels can anchor in the middle of the cove in a moderate depth.

35 Port Karbun, page 223, is generally preferred by vessels wind bound in this part of the Adriatic, as its two entrances enable them to leave with any wind. The anchorage is abreast some dwellings from which footpaths lead inland, in a depth of about 14 fathoms (25^m6), sand and weed. When approaching Port Karbun from southward, Mount Kula, bearing about 341° , indicates the position of the eastern entrance. When intending to enter by this channel a vessel should pass between Objak and Zvirinović, keeping the eastern end of the latter aboard to avoid the $4\frac{1}{2}$ -fathom (8^m2) shoal in the middle of the channel. Gubesa should be passed on its eastern side; but it is steep-to and, in case of necessity, may be passed on either side. When bound to Port Karbun from westward, either of the channels between the islets off Rt Ključ may be taken, but the current between these islets is strong.

Chart 2712.

Uvala Triluka, page 223, has room only for small vessels, with local knowledge, which find shelter in the three creeks at its head.

Large vessels can anchor, in the fine season, in the haven formed by Korčula and the four islets extending south-eastward of Rt Ključ, but they are exposed to the Scirocco.

Western side of Korčula.—From Rt Velo Danče, the western

Charts 2712, 1440, 2158a, 2158b.

To face page 225.

Mt Hom.



*Otočić Kamenjak.
Sveti Ivan church.*

*Velutka church.
Rt Vranac.*

Church and lighthouse on Rt Vranac in line, bearing 084°, leads in.

Velalučki zaliv.

(Original dated 1910.)

Rt Vranina.

Chart 1611, plan of Port Karbun, Port Prižba and Brna Harbour.

side of Korčula trends about three-quarters of a mile northward to Rt Krnirat, a high and wooded point, with two small coves. Between Rt Velo Danče and the southern entrance point of Trstena cove, northward of it, a narrow bank projects about 2 cables north-westward, with 5

Čančir rock, 10 feet (3^m0) high, on its outer part.

Charts 1611, plan of Vela Luka bay, 2712.

Velalučki zaliv.—Islets and dangers.—This bay is entered between Rt Krnirat and Rt Proizd (*Lat. 42° 59' N., Long. 16° 36' E.*), the western extremity of an islet of the same name, about 3 miles 10 north-north-westward. It affords good anchorage for vessels of any size. The town of Velaluka which had a population of 5,715, in 1931, is situated at the head of the bay on its southern and eastern shores, and the town of Blato is situated about 3½ miles inland.

Velaluka is fronted by a sea wall and there is a quay, with a depth 15 of about 1½ fathoms (2^m3) alongside, facing the southern part of the town. A short jetty, with a similar depth at its head, lies close eastward of this quay.

Provisions can be obtained.

Otočić Proizd is 79 feet (24^m1) high, and covered with brushwood; 20 it is separated from the north-western end of Korčula by a boat channel, about 1½ cables wide, with a depth of 10 feet (3^m0) in the fairway; a rocky spit extends about a quarter of a mile from the western end of the islet.

Otočić Kamenjak, 49 feet (14^m9) high, lies about 2½ miles east- 25 south-eastward of Rt Proizd and half a mile off the northern side of Velalučki zaliv.

Uvala Potplat is entered on the south-eastern side of Velalučki zaliv, between Rt Krnirat and Rt Vranina, about 1½ miles north-eastward; this cove is exposed to westerly winds and the holding ground 30 is bad.

Otočić Ošljak (Ošjak), 213 feet (64^m9) high and covered with brushwood, is situated about a mile east-south-eastward of Otočić Kamenjak and 1½ cables off the southern side of the bay.

A shoal, with a depth of 3½ fathoms (5^m9) over it, lies about 4 cables 35 west-south-westward of Otočić Kamenjak; a shoal, with a depth of 5 fathoms (9^m1) over it, lies about three-quarters of a mile west-north-westward of the same islet and 2 cables offshore. Velaluka church in line with the light-structure on Rt Vranac, situated on the northern side near the head of the bay, bearing 094°, leads nearly a cable south- 40 ward of the 3½-fathom (5^m9) shoal. See view facing this page.

Lights.—A light is exhibited, at an elevation of 38 feet (11^m6), from a square stone tower, 27 feet (8^m2) in height, on Rat Proizd (*Lat. 42° 59' N., Long. 16° 36' E.*).

A light is exhibited, at an elevation of 32 feet (9^m8), from an hexa- 45 gonal stone tower, 23 feet (7^m0) in height, situated on the southern side of Otočić Kamenjak.

A light is exhibited, at an elevation of 24 feet (7^m3), from an iron tower, 19 feet (5^m8) in height, on Rt Vranac.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron 50 column, 18 feet (5^m5) in height, situated on the western end of the quay at Velaluka.

Anchorage.—The best anchorages for large vessels are 2½ cables eastward of the north-eastern extremity of Ošljak or 3½ cables east-

Charts 1611, plan of Vela Luka bay, 2712.

north-eastward of the same point ; the available space is considerable, with depths of from 18 to 26 fathoms (32^m9 to 47^m5), sand, and well sheltered, being open only to west-north-westerly winds. Westward and southward of the first position, the bottom is rocky.

For small vessels, the most secure place in the bay is Uvala Plitvine, about a quarter of a mile north-westward of Rt Vranac, in depths of from 8 to 13 fathoms (14^m6 to 23^m8), sand and mud, with cables laid out to the weather shore. There is also anchorage for small vessels off the town, in depths of from 6 to 12 fathoms (11^m0 to 21^m9), and higher up in a narrow landlocked arm, which extends northward from the town, in depths of from 2 to 3 fathoms (3^m7 to 5^m5). Small vessels can also anchor in easterly winds in Veli Pelegrin cove, northward of Otočić Kamenjak (*Lat.* 42° 58' N., *Long.* 16° 39' E.).

Uvala Gradina (Port Iradina) is much frequented by small vessels, with local knowledge, being conveniently situated for getting under way ; it lies about 6 cables northward of the western end of Ošljak and has depths of from 2 to 2½ fathoms (3^m7 to 4^m6). Sveti Ivan peninsula, with a church on its summit, and joined to the main island by an embankment, forms the southern side of the bay. The entrance is divided into two passages by Otočić Gubeša, 19 feet (5^m8) high, northward of which is the proper channel, where there is a strong outdraught at the beginning of the out-going tidal stream.

A mooring buoy lies, in a depth of 3½ fathoms (6^m4), off the quay at Velaluka.

Directions.—Mount Hum (Hom), a conical hill completely covered with trees, rises to an elevation of 1,237 feet (377^m0) immediately over the southern side of Velalučki zaliv, and indicates its position. On approaching the land Rt Krnirat and Otočić Proizd will readily be identified and a course may be steered for Otočić Ošljak, passing southward of Otočić Kamenjak and the 3½-fathom (5^m9) shoal ; both sides of Ošljak are clear.

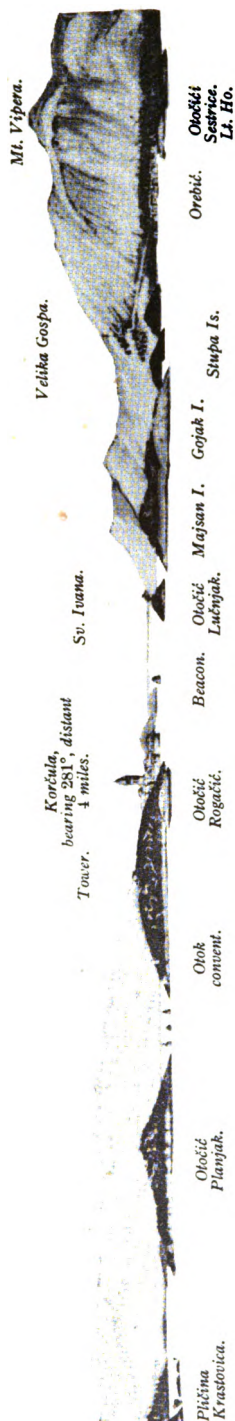
From westward, Velaluka church in line with the light-structure on Rt Vranac, bearing 094°, leads into the anchorage.

35 Chart 1611, plan of Pelješac channel.

PELJEŠAČKI KANAL.—**General description.**—The south-eastern entrance of Pelješčki (Pelješac) kanal is described on page 220. The channel lies between Korčula and the western end of Poluotok Pelješac. It affords good anchorage throughout for vessels of any size, about half a mile offshore, in depths of from 18 to 24 fathoms (32^m9 to 43^m9), sand. There is often a strong west-going current in this channel. H.M.S. *Mačaya*, in 1938, reported that, during the summer of that year, a predominantly east-going current was observed off the town of Korčula. The western end of Pelješčki kanal leads into the south-eastern portion of Korčulanski kanal.

Several islets lie a short distance within the south-eastern entrance of Pelješčki kanal ; the principal of which are Bisača, 39 feet (11^m9) high, about a mile northward of Rt Ražnjić ; Sutvara, 118 feet (36^m0) high and wooded, about 4 cables west-north-westward of Bisača ; Majsan, 102 feet (31^m1) high and wooded, about a mile northward of Sutvara ; Gojak, 46 feet (14^m0) high, about 2 cables east-south-eastward of Majsan ; and Otočići Sestrice, two in number, about 4 cables

Charts 1440, 2158a.



Pelješčaki kanal, eastern entrance.

(Original dated 1910.)

Chart 1611, plan of Pelješac channel.

north-eastward of Gojak (*Lat. 42° 57' N., Long. 17° 12' E.*). See view on chart 1611 and view facing this page.

There are several above-water rocks and dangers in the vicinity of these islets, the positions of which can best be seen on the chart. 5

Channel.—Islets and dangers.—Beacons.—From Rt Ražnjić, the south-western side of Pelješački kanal trends $3\frac{1}{2}$ miles north-westward to Rt Križ, forming several coves. For a distance of about 2 miles north-westward of Rt Ražnjić, the north-eastern side of Korčula is fringed by a bank, with depths of less than 5 fathoms 10 (9^m1) over it, which is as much as 2 cables wide in places.

The village of Lumbarda, which contained 2,000 inhabitants, in 1931, and off which there is a small mole, lies near the coast, about a mile west-north-westward of Rt Ražnjić. Small craft, with local knowledge, can secure along the inner side of the mole. 15

Several islets, rocks, and shoals lie off this stretch of coast. Pličina Bisača, with a depth of $6\frac{1}{2}$ fathoms (11^m9) over it, lies nearly midway between Otočić Bisača and Rt Lenga, situated about a quarter of a mile north-westward of Rt Ražnjić. Pličina Lenga, with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, lies about a quarter of a mile north-north- 20 westward of Rt Lenga; and Pličina Biližal, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies nearly midway between Pličina Lenga and the coast of Korčula south-westward. Hrid Knežic, 10 feet (3^m0) high, lies on the coastal bank, close offshore, about 4 cables west-north-westward of Rt Lenga. 25

Otočić Gubavac, 42 feet (12^m8) high, and surrounded by a shallow bank, lies about $2\frac{1}{2}$ cables northward of Hrid Knežic; Pličina Gubavac, which breaks, lies near the end of a bank, with depths of less than 4 fathoms (7^m3) over it, which extends about 2 cables from the northern side of the islet. There is a channel, about 3 cables wide, 30 between this bank and Sutvara north-eastward. Otok convent, bearing 307°, and open north-eastward of Otočić Planjak, leads north-eastward of Pličina Bisača and Pličina Gubavac. See view A on chart.

The northern side of Pličina Gubavac is marked by a beacon, 13 feet (4^m0) high, consisting of an iron staff, painted green, surmounted by 35 a ball.

Otočić Vrnik, 164 feet (50^m0) high lies with its south-eastern extremity about 3 cables westward of Otočić Gubavac; between Otočić Vrnik and Korčula there is a narrow channel, with a depth of 3 fathoms (5^m5) in the fairway, leading into Kanal Ježevica. There is an extensive 40 quarry on Vrnik; on the northern and north-western sides of the islet there are two chapels and some houses.

Luka Bufalo lies between the south-western side of Vrnik and the coast of Korčula. For anchorage, see page 231.

Kanal Ježevica lies between a group of islets, rocks and shoals 45 extending northward and north-westward of Vrnik, on its north-eastern side, and the coast of Korčula between the point abreast Vrnik and Rt Križ, on its south-western side. For anchorage, see page 231.

Pličina Krastovica, on which there is a rock, awash, lies in the 50 south-eastern approach to Kanal Ježevica, from half a cable to $1\frac{1}{2}$ cables off the north-eastern extremity of Otočić Vrnik; it occupies more than half the channel between that islet and Otočić Planjak, a quarter of a mile northward, and divides it into two parts, the northern

Chart 1611, plan of Pelješac channel.

being the wider and deeper, with a depth of $4\frac{1}{2}$ fathoms (8^m2) in the fairway.

- Otočić Kamenjak, 46 feet (14^m0) high, lies about $1\frac{1}{2}$ cables north-
 5 north-westward of Otočić Vrnik, on the southern end of a bank which
 extends south-westward and southward from Otočić Planjak. Pličina
 Oplovit, with an above-water rock on it, lies near the middle of the
 channel between Kamenjak and Planjak; there is a depth of 2 fathoms
 (3^m7) in the fairway on either side of this reef.
- 10 Pličina Oplovit is marked by a circular stone beacon, 2 feet (0^m6)
 high.

- Otočić Planjak, 167 feet (50^m9) high, is connected to the south-
 eastern end of Otočić Otok (Badia), northward, by a shallow bank,
 about a cable wide. To indicate that there is no passage between
 15 these islets, this bank is marked by three circular stone beacons on
 square bases, each 5 feet (1^m5) high, the northern painted black and
 surmounted by a cone, the southern painted white and surmounted by
 a cylinder, and the middle beacon painted white and surmounted by
 a ball.

- 20 Hrid Beretica (Baretta), only a little above water, lies about a cable
 off the north-western end of Otočić Planjak. Hrid Beretica is marked
 by a stone cross (*Lat.* $42^\circ 57' N.$, *Long.* $17^\circ 10' E.$).

- On the south-western side of Kanal Ježevica, about 3 cables west-
 south-westward of Hrid Beretica, a spit, with a depth of $1\frac{1}{2}$ fathoms
 25 (2^m3) over its outer end, extends about a cable offshore.

- Otočić Otok (Badia), the northernmost and largest of the islets lying
 on the north-eastern side of Kanal Ježevica, is connected to Otok
 Korčula by a narrow ridge over which a depth of 14 feet (4^m3) can be
 carried. Otočić Otok is 243 feet (74^m1) high and covered with bushes;
 30 there is a convent on its southern side.

- Otočić Rogačić, 62 feet (18^m9) high; lies on the edge of a shallow
 bank extending about $1\frac{1}{2}$ cables off the north-eastern side of Otok.
 Pličina Rogačić, with a depth of one fathom (1^m8) over it, lies $1\frac{1}{2}$ cables
 south-eastward of the islet of that name and about 2 cables off the
 35 eastern end of Otok.

- Otočić Lučnjak, 62 feet (18^m9) high, lies about 2 cables northward of
 Otočić Rogačić; Pličina Lučnjak lies about 2 cables westward of the
 islet of that name.

- Pličina Lučnjak is marked by an octagonal concrete beacon, 6 feet
 40 (1^m8) high, painted with red and black bands and surmounted by a
 ball.

- Pličina Križ, with a depth of 2 fathoms (3^m7) over it, lies in the north-
 ern approach to Kanal Ježevica, about $1\frac{1}{2}$ cables north-eastward of Rt
 Križ.

- 45 On the northern side of Pelješčki kanal, Zaliv Trstenica is entered
 between the western entrance point of Uvala Lučica, page 220, and a
 point about 2 miles west-north-westward. The village of Orebić,
 at the western end of which a mole projects about a cable offshore,
 extends along the shore for a distance of half a mile westward of the
 50 western entrance point of this bay. Zaliv Trstenica is open southward
 and the western part is shallow, depths of less than 5 fathoms (9^m1)
 extending as much as 4 cables offshore near the head of the bay. In
 the north-western part of the bay there are two above-water rocks and
 several reefs lying close offshore. For anchorage, see page 231.

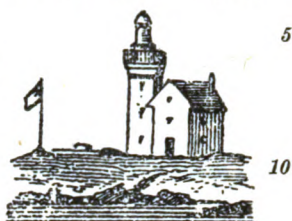
Charts 2713, 2712, 1440, 2158a.

Chart 1611, plan of Pelješac channel.

Lights.—A light is exhibited, at an elevation of 58 feet (17^m7), from a white square tower and dwelling, 40 feet (12^m2) in height, on the north-western of Otočići Sestrice (*Lat.* 42° 58' N., *Long.* 17° 13' E.).

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 18 feet (5^m5) in height, on the molehead at Lumbarda.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 15 feet (4^m6) in height, on the molehead at Orebić.

**Channel.—Telegraph cable.—Beacon.**

On the northern side of Pelješčki kanal, between the mole at Orebić and Rt Zamošće, 2 miles westward, the coast is characterised by a range of rocky heights about 2 cables inland, elevated from 328 to 492 feet (100^m0 to 150^m0). Velika Gospa (S. Frane), surrounded by cypress trees which cover the slope of the hill down to the shore, stands on the summit of the range, about a mile west-north-westward of Orebić mole, and Sveta Ana chapel, elevated 374 feet (114^m0), stands about three-quarters of a mile farther westward; these are the best navigational marks in the channel. Rt Zamošće is low and covered with trees.

A telegraph cable, indicated on the chart, crosses the channel about 1½ miles westward of Orebić; both shore ends are marked by huts. A vessel must avoid anchoring near the cable.

Sidrište Kućište is situated off a bight in the coast between Rt Zamošće and Rt Rat, about a mile west-north-westward; the chapel of Sveti Liberan, surrounded by trees, stands on a low point, about a quarter of a mile farther westward. The shores of the bight are fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, about three-quarters of a cable wide. The village of Kućište, where the land is cultivated, lies at the head of the bight; a mole, with a depth of 11 feet (3^m4) at its head, projects from the coast in the vicinity of the village. For anchorage, *see* page 232.

On the southern side of Pelješčki kanal, Uvala Luka is entered between Rt Križ and a point about 1½ cables south-westward. A shallow bank extends about a cable from the head of this inlet with an above-water rock near its outer edge. On the north-western side of the inlet, there is a quay with bollards, alongside which small craft, drawing 6 feet (1^m8), can berth. For anchorage, *see* page 232.

The small town of Korčula, which had a population of 2,000, in 1931, stands on a small peninsula, about half a mile north-westward of Rt Križ; it is overlooked by a fort south-westward and is mostly surrounded by old walls.

Conspicuous objects are:—An old tower on the 272-foot (82^m9) peak south-westward of the town; the high church tower in the middle of the town; and Sveti Nikola monastery, on the western entrance point of Luka Korčula.

Luka Korčula is situated westward of the town; its entrance is about 2 cables wide and a shallow spit extends about half a cable from both entrance points. There is a masonry quay on the eastern side of the port with a short mole at its northern end. This quay extends round to the eastern side of the peninsula on which the town

Chart 1611, plan of Pelješac channel.

stands, where small craft can secure alongside, sheltered from north-westerly winds. For anchorage, *see* page 232.

The entrance to Luka Banja, about a cable wide, is situated westward of a point lying about a mile westward of Korčula mole; for anchorage, *see* page 232.

The entrance to Uvala Vrbovica, about a cable wide, is situated eastward of a point about $1\frac{1}{2}$ miles westward of Korčula mole. Pličina Vrbovica, with depths of less than one fathom (1^m8) over it, lies from a quarter of a cable to one cable off the eastern entrance point. Pličina Vrbovica is marked by a white stone beacon, 10 feet (3^m0) high. For anchorage, *see* page 232.

Otočić Mulić, an islet, 15 feet (4^m6) high, lies $3\frac{1}{2}$ cables westward of the western entrance point of Uvala Vrbovica, and less than a cable offshore.

Uvala Kneža is entered between Rt Debela, about $1\frac{1}{2}$ miles westward of Mulić, and Otočić Kneža Velika, 75 feet (22^m9) high, about half a mile farther north-westward. Rt Kneža, the extremity of a promontory projecting eastward, lies about a cable westward of Kneža Velika and together they shelter Uvala Kneža from westerly and northerly winds. Both the islet and the point are covered with dark bushes. There is a depth of 2 fathoms (3^m7) between the islet and the point. Otočić Kneža Mala, 36 feet (11^m0) high, lies 2 cables south-westward of Kneža Velika and close offshore. Kneža Velika should not be closely approached; between it and Rt Sveti Ivana, on the mainland, about half a mile north-eastward, is the narrowest part of Pelješčki kanal. For anchorage, *see* page 232.

On the northern side of Pelješčki kanal, Sidrište Viganj is situated off a bight in the coast between the point on which the chapel of Sveti Liberan stands, and Rt Sveti Ivana. The north-eastern shore of this bight is fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, about a cable wide. Sidrište Viganj is sheltered from the Bora and westerly winds and sea, and partly sheltered from the sea from an easterly direction by the low point at the eastern end of the bight. The village of Viganj, in which is Gospa od Ružarija with a tower, lies on the north-eastern side of the bight.

Rt Sveti Ivana is steep, and the land rises to a height of 931 feet (283^m8) at the distance of about $3\frac{1}{2}$ cables north-eastward of it. Over the point, at an elevation of 164 feet (50^m0), there is a chapel, surrounded by cypress trees. For anchorage, *see* page 232.

From Rt Sveti Ivana the coast trends about $3\frac{1}{2}$ miles west-north-westward to Rt Osićac (Osit) (Lat. $43^{\circ} 01' N.$, Long. $17^{\circ} 00' E.$). *Chart 2712.*

Rt Osićac is a narrow, steep tongue of land 98 feet (29^m9) high, and nearly bare, which projects about 7 cables north-westward; a low strip of land connects it with the coast and from a distance it appears as an island.

Chart 1611, plan of Pelješac channel.

On the southern side of Pelješčki kanal. Luka Račišće, the entrance to which is about 2 cables wide, lies about $1\frac{1}{2}$ miles westward of Rt Kneža. The harbour is open northward and the bottom, in the middle, consists of mud. A mole projects eastward from the town of Račišće situated on the south-western side of the head of the harbour. For anchorage, *see* page 232.

Charts 2712, 1440, 2158a.

Chart 1611, plan of Pelješac channel.

Pelješčki kanal is entered from westward between Luka Račišće and Rt Osišćac, about 2 miles northward.

The northern side of Otok Korčula, westward of Račišće, is described under Korčulanski kanal, page 243.

Lights.—A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 19 feet (5^m8) in height, on the molehead at Luka Korčula.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron structure, 13 feet (4^m0) in height, on the corner of the health office at Luka Korčula.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m6) in height, on the mole head at Kučište.

A light is exhibited, at an elevation of 44 feet (13^m4), from a red conical iron tower, on a white masonry base, 25 feet (7^m6) in height, on the north-eastern extremity of Kneža Velika (*Lat.* 42° 59' N., *Long.* 17° 03' E.).

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 17 feet (5^m2) in height, on the mole head at Račišće.

Anchorage in Pelješčki kanal.—**Directions.**—Pelješčki kanal affords good anchorage throughout for vessels of any size, about half a mile offshore in depths of from 18 to 24 fathoms (32^m9 to 43^m9), sand, care being taken to avoid the telegraph cable.

Luka Bufalo, page 227, affords good shelter to small vessels from all winds in its northern part, in a depth of about 8 fathoms (14^m6), mud, where a hawser can be laid out to Vrnik. The approach to this anchorage is southward of Otočić Gubavac.

In Kanal Ježevica, page 227, there is well sheltered anchorage in depths of from 7 to 12 fathoms (12^m8 to 21^m9); the best anchorage is south-westward of Otok convent, in a depth of 10 or 11 fathoms (18^m3 or 20^m1); the bottom of sand, shells and mud is reliable all over the channel.

Approaching Kanal Ježevica from southward, a vessel passing south-westward of Sutvara, should steer with Otok convent, bearing 307°, open north-eastward of Planjak until past Pličina Gubavac. See view A on chart 1611. Thence the channel is between Planjak and Kamenjak, on the northern side, and Vrnik, on the southern side. Pličina Krastovica should be avoided by keeping Otočići Sestrice lighthouse in line with the north-western extremity of Gojak, bearing 052°, astern, which leads midway between Planjak and Pličina Krastovica, in a depth of 4½ fathoms (8^m2); thence a vessel should steer between Kamenjak and Vrnik, hauling northward round the former for the anchorage.

A vessel entering Kanal Ježevica from northward, should avoid Pličina Križ by keeping either shore aboard. This entrance is only available for vessels drawing less than 14 feet (4^m3).

Vessels can anchor off the village of Orebić, page 228, on the northern side of Pelješčki kanal, but the shore bank is too wide to allow them to make fast to the shore. A large vessel should only anchor here in settled fine weather as the holding ground is not good; the Bora blows hard and the Scirocco and westerly winds cause a considerable sea. The best anchorage is south-westward of the mole, in a depth of about 9 fathoms (16^m5), sand and weed, or farther out as convenient. Small vessels find shelter from easterly winds alongside the outer

Chart 1611, plan of Pelješac channel.

portion of the north-western side of the mole, where there are depths of about 12 feet (3^m7), or secured to bollards westward of the village.

- 5 About a mile westward of Orebić, there is anchorage, with means of securing a vessel to the shore, marked by some houses overlooked by Velika Gospa convent on the eastern side.

- In Sidrište Kučište, page 229, large vessels can anchor south-south-eastward of Lazarović house, at the eastern end of the village, in
10 depths of from 18 to 21 fathoms (32^m9 to 38^m4), about 2 cables offshore; small vessels can anchor near the land, where, eastward of the village, there are some mooring bollards, and are more sheltered than in Sidrište Viganj. The Bora blows here sometimes with great violence, then vessels find better shelter in Sidrište Viganj though large vessels
15 may find good anchorage here in that wind.

- In Uvala Luka, page 229, on the southern side of the channel, small vessels can anchor westward of the 157-foot (47^m8) peak near the eastern shore of the inlet (*Lat. 42° 57' N., Long. 17° 09' E.*). The sandy bottom is not everywhere reliable. There are some mooring buoys in
20 the inlet.

- Luka Korčula, page 229, affords accommodation for small vessels, with local knowledge, but they are exposed to northerly and westerly winds and, in the Bora season, there is but little security; during winter these vessels lie better in Uvala Luka. In Luka Korčula there
25 is a mooring buoy, about a cable south-westward of the mole head, to which small vessels can secure, or they can make fast alongside the quay, where there are depths of about 13 feet (4^m0). Large vessels can anchor outside the harbour in a depth of about 22 fathoms (40^m2).

- Luka Banja, page 230, affords good shelter to small vessels, with local
30 knowledge, in easterly winds, in depths of from 8 to 9 fathoms (14^m6 to 16^m5), sand, good holding ground, with a hawser laid out to the north-eastern shore.

Uvala Vrbovica, page 230, affords shelter to small craft in depths of from 3 to 7 fathoms (5^m5 to 12^m8).

- 35 In Uvala Kneža, page 230, small vessels, with local knowledge, can anchor in depths of from 3 to 5 fathoms (5^m5 to 9^m1), mud, south-westward of Otočić Kneža Mala, and are sheltered from winds from the western semi-circle.

- In Sidrište Viganj, page 230, large vessels can anchor south-west-
40 ward of Gospa od Ružarija, in depths of from 11 to 15 fathoms (20^m1 to 27^m4), mud, about 2 cables offshore; small craft can anchor farther in on a weedy bottom, where they make fast to the shore.

- In Luka Račišće, page 230, small vessels can anchor northward of the mole, in a depth of about 8 fathoms (14^m6), and secure to the
45 shore; vessels, with local knowledge moor within the mole.

Directions for Pelješčki kanal.—In order to avoid damage to lighters moored in Luka Korčula, all vessels passing between Otok Korčula and Poluotok Pelješac must do so at reduced speed, in any case not exceeding 10 knots.

- 50 Entering the channel from eastward, the shore of Poluotok Pelješac should be closed and a course steered to pass eastward and northward of all the islets in the entrance. Sveti Nikola monastery in line with the light structure on the mole at Korčula, bearing 264°, leads northward of the islets in the entrance. With a fair wind and the aid of the chart,

Charts 2713, 2712, 1440, 2158a.

Chart 3611, plan of Pelješac channel.

the passage northward of Otočić BISAČA and between Majsan and Otok islets may be taken. See view facing page 227.

The current is usually west-going, its rate is sometimes considerably accelerated by strong easterly winds. Northerly and north-easterly winds are dangerous to sailing craft, the northern side of Otok Korčula, when westward of Rt Osičac (*Lat. 43° 01' N., Long. 17° 00' E.*), being then a lee shore and affording no shelter; it is advisable to close the southern side of Otok Hvar, and, if necessary, either anchor in Šćedarski kanal, or run under the lee of Otok Korčula. With southerly winds, either the harbour of Hvar, the harbour of Šćedro, or Uvala Luka, at the western end of Poluotok Pelješac, may be reached.

When making for the passage from westward, Vipera (Mount Sveti Ilija), the summit of Poluotok Pelješac, 3,150 feet (960^m) high, standing about 7 miles eastward of Rt Osičac, is a conspicuous hummock. The approach between Rt Osičac, on the northern side, and the town of Račišće, on the southern side, is clear of dangers, and readily identified; Rt Sveti Ivana, high and with a chapel on it, will be next seen, and Rt Kneža, which is woody and of moderate height, southward. Between these points the channel is deep and clear of dangers.

Proceeding eastward, a vessel may anchor in Sidrište Viganj or Sidrište Kučište, or pass through the eastern end of the channel.

Chart 2712.

Western end of Poluotok Pelješac.—Anchorages.—Between Rt Osičac and Rt Lovište, about 2½ miles northward, there is a bight at the western end of Poluotok Pelješac. The shores of this bight are indented with coves; Uvala Luka, entered between Rt Piščata (Bila), about three-quarters of a mile north-eastward of Rt Osičac, and Rt Ključ, about half a mile farther northward, affords the best shelter. A bank, with a depth of 3 fathoms (5^m5) at its outer end, extends about 3½ cables westward from Rt Piščata and a detached 4-fathom (7^m3) rocky patch lies about 4 cables offshore, in the fairway of the north-western approach to the port.

Small vessels, with local knowledge, can anchor in Uvala Luka, in a depth of 9 fathoms (16^m5), mud, and secure to the northern shore.

Large vessels can anchor westward of Rt Ključ, in a depth of 17 fathoms (31^m1), tenacious mud, where they are well sheltered from a Bora or Scirocco. With light or contrary winds, sailing vessels unable to stem the west-going current find this a convenient temporary anchorage.

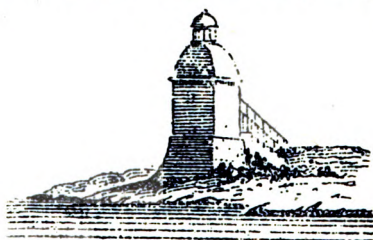
Light.—A light is exhibited, at an elevation of 33 feet (10^m1), from a masonry tower with a cupola, 37 feet (11^m3) in height, on Rt Lovište. See view.

OUTLYING ISLANDS.—

Some islands and islets lie at a considerable distance off the eastern side of the Adriatic, in the western approaches to the various channels between the islands adjacent to the coast. Jabuka, the westernmost of these islets, lies as much as 67 miles westward of Rt Lovište.

Vis.—Otok Vis, the largest of these outlying islands, lies with Rt

Charts 2713, 2712, 1440, 2158a.



Rt Lovište lighthouse.

Chart 2712.

Stončica (*Lat. 43° 04' N., Long. 16° 15' E.*), its north-eastern extremity, about 16 miles west-north-westward of Rt Proizd, page 225. The island presents an irregular hilly appearance and is covered with trees ;
 5 Hum, the summit, 1,920 feet (585^m2) high, is bare-topped and has a small tower on it ; when seen from south-eastward, eastward or north-westward, it presents two distinct hill tops on the lower of which there is a chapel. This island is traversed by three ranges of hills with fertile valleys between ; these hills slope steeply westward. The
 10 southern side of the island rises abruptly and is higher than the northern side, towards which the land descends in gradual cultivated slopes on which there are several towers. The coasts are high and steep-to, except in the immediate neighbourhood of the south-eastern coast. The climate is very mild. See views A and C on chart 2712.
 15 **Telegraph cable.**—There is a cable, indicated on the chart, between Uvala Smokova Mala, at the north-eastern end of Vis, and Luka Soline in Otok Kliment (Klement), north-eastward.

Eastern side of Vis.—Rt Stončica is bare, rocky, and slopes gently to the sea.

20 The coast between Rt Stončica and Rt Polivalo, the south-eastern extremity of Vis, about 4 miles south-westward, is indented, mostly overgrown with bushes and its northern part is steeper than the southern ; it is bordered by a chain of islets, rocks and shoals, to a distance of about a mile offshore, and should be avoided by a stranger. A
 25 rocky shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 5 miles south-eastward of Rt Stončica (*Lat. 43° 04' N., Long. 16° 15' E.*).

Small vessels, with local knowledge, find shelter from southerly and westerly winds in Uvala Smokova Velika, in a depth of 7 fathoms
 30 (12^m8) ; Otočić Pločica, situated on a spit extending a short distance offshore, lies off the northern entrance point of this bay and half a mile southward of Rt Stončica. Uvala Milna, 1½ miles south-westward of Uvala Smokova Velika, affords shelter to small vessels, with local knowledge, from all winds. There is also anchorage, about three-
 35 quarters of a mile southward of Uvala Milna, in a depth of about 16 fathoms (29^m3), between the largest of Otočići Budikovci which is 138 feet (42^m1) high, and the coast of Vis westward.

Otočić Ravnik, the south-westernmost of the chain of islets just mentioned, is 131 feet (39^m9) high ; between it and the coast of Vis is
 40 Luka Rukavac, which has a depth of 12 fathoms (21^m9) in it. It is exposed to northerly and southerly winds, and those from south-eastward cause a heavy sea, but the holding ground is good. The best berth is north-westward of the centre of the islet, and the best passage to it is from south-westward. Small vessels may anchor in the inner-
 45 most part of the harbour during a Bora, with hawsers to the shore, but this anchorage is dangerous in a Scirocco.

Light.—Signal station.—A light is exhibited, at an elevation of 125 feet (38^m1), from an octagonal stone tower with dwelling, 92 feet (28^m0) in height, on Rt Stončica (*Lat. 43° 04' N., Long. 16° 15' E.*).
 50 There is a signal station near the lighthouse with which vessels can communicate by means of the International Code of Signals. The station is connected to the general telegraph system.

Southern and western sides of Vis.—Between Rt Polivalo and Rt Stupišće, the south-western extremity of Vis, the coast is rocky

Charts 1440, 2158a.

Chart 2712.

and inaccessible, the slopes being covered with bushes. A wall of red rock between Bili (Bjeli) rat, about 2 miles eastward of Rt Stupište, and Uvala Pretišćina, 3 cables westward, is conspicuous. During a 5
Bora, a vessel may find temporary shelter under this coast, but the anchor must be dropped very close inshore; there are two or three coves in which small vessels, with local knowledge, can find convenient anchorage.

Komiški (Komiža) zaliv is entered between Rt Stupište (*Lat.* 43° 00' N., *Long.* 16° 04' E.) and Križni (Knez) rat, about 2 miles north- 10
ward. It is sheltered by high land from all easterly winds and is a place of refuge from the Bora and from south-easterly gales, but westerly and south-westerly winds cause a heavy sea, though it is to some extent protected by Otok Biševo from the latter direction. There are a number of mooring buoys off the north-western and 15
eastern shores.

Both entrance points of this bay are steep-to, but the land within Rt Stupište slopes gradually to the sea and is covered with pine trees. See view C on chart 2712. A sunken rock lies about 2 cables north-ward of Rt Stupište and close offshore. 20

The town of Komiža, which had a population of 4,650, in 1943, is situated on the north-eastern side of the bay. Sveti Nikola church, with a belfry, south-eastward, the chapel of Santa Maria, north-westward, and a round roofed-in well, about 2½ cables southward of the 25
town are all conspicuous.

Komiža is in frequent steamer communication with Split. 25

Otočići Barjaci, two in number, the inner one of which is 19 feet (5^m8) high, lie close off Rt Barjaci, the north-western extremity of Vis, situated about a mile north-westward of Križni rat. These islets 30
may be rounded at a prudent distance.

Greben Ploča, with a depth of 5 fathoms (9^m1) over it, lies about three-quarters of a mile, north-westward of Mali Barjak, the outer islet; and Greben Seget, with a depth of 5½ fathoms (10^m1) over it, lies about half a mile farther north-westward. 30

Lights.—A light is exhibited, at an elevation of 20 feet (6^m1), 35
from a black iron column, 17 feet (5^m2) in height, on the head of the mole at Komiža.

A light is exhibited, at an elevation of 41 feet (12^m5), from a red square iron framework structure, 22 feet (6^m7) in height, on the summit 40
of Mali Barjak.

Anchorage.—The anchorage in Komiški zaliv is off the town, but the depths are great and a vessel must go close in; the bottom is mud. Vessels with local knowledge moor in the cove protected by the mole. There is room for two small vessels to lie alongside the inner face of the mole, where there are depths varying from 16 to 10 feet 45
(5^m0 to 3^m0). There is also anchorage half a mile southward of the mole, but farther in that direction, the bottom is rocky.

Mount Hum and Otok Biševo are good marks for the anchorage.

Working up under the land a vessel should be prepared for heavy squalls. 50

The northern side of Vis is described on page 237.

Biševski kanal.—This channel, between Otok Vis and Otok Biševo, which lies with Rt Parnikoza, its northern extremity, about 2½ miles west-south-westward of Rt Stupište, is deep and clear of

Chart 2712.

dangers, but the latter point should be avoided, as the west-going current sweeps round it. Biševski kanal is the shortest route between the ports on the eastern side of the head of the Adriatic and the south-eastern end of that sea, and by day, in fine weather, is used with advantage; by night, with strong north-easterly or south-westerly winds, and especially in the unfavourable season, Viški kanal, page 237, is to be preferred.

Otok Biševo is hilly and rises abruptly; Velagora, its summit, situated at the south-eastern end of the island, is 787 feet (239^m9) high. The coasts are indented with several coves and, with the exception of the western coast, which slopes gradually, are steep; the slopes for the most part are covered with bushes. The depths round the island are everywhere considerable; a sunken rock lies close off the north-eastern extremity of the island, and though an above-water rock may be seen here and there, close offshore, there are no outlying dangers. The principal above-water rock is Hrid Galijola, situated about 4 cables east-north-eastward of Rt Galijola (Galjola), the south-western extremity of the island and 1½ cables offshore. See view C on chart 2712.

There is no anchorage for large vessels off Otok Biševo; small vessels, with local knowledge, find shelter from the Bora or Scirocco in Luka Biševo on the western side of the island, but on the wind springing up from westward or south-westward they must leave at once.

Islets westward of Vis.—Dangers.—Otočić Svetac (Sveti Andrija) is situated with Rt Šijabod, its north-eastern extremity, about 12 miles west-south-westward of Mali Barjak. The numerous fishing boats which frequent it are obliged to seek shelter under its lee, or in Slatina cove, which is protected by a breakwater, on the south-eastern side of the islet. It is 1,020 feet (310^m9) high, the higher parts being thickly wooded. The coast is rocky, and the north-western side reddish in colour. A few above-water rocks lie close off Zlatna Glava point, the southern extremity, and a sunken rock lies close off Rt Križica, its south-western extremity; elsewhere the depths are considerable all round the islet. See view on chart 2712.

Hrid Kamik, dark and jagged, with considerable depths around it, lies about half a mile westward of Rt Križica; midway between the islet and the point, the water is deep, but the passage should not be taken unnecessarily, as the current through it is irregular.

Otočić Brusnik, 39 feet (11^m9) high and blackish in colour, with some above-water rocks close off its south-eastern and north-western sides, lies about 1½ miles south-eastward of Otočić Svetac. About 2 cables northward of Otočić Brusnik, there is a rocky shoal, with a depth of 3¾ fathoms (6^m9) over it. Pličina Mustaćin, with a depth of 16 fathoms (29^m3) over it, and Pličina Ploča, with a least depth of 8 fathoms (14^m6) over it, lie about three-quarters of a mile north-north-eastward and south-south-eastward, respectively, of Otočić Brusnik.

The currents in this vicinity are irregular and cause strong eddies, especially in winter, and the depths are too great for anchoring. These islets should be avoided, especially by sailing vessels with light winds.

Otočić Jabuka (*Lat.* 43° 05' N., *Long.* 15° 28' E.), situated about 12 miles west-north-westward of Otočić Svetac, being in the centre of

Charts 2712.

the Adriatic, is an excellent point of departure for vessels bound from the Italian coast to the neighbourhood of Rt Ploča or the channels leading to Split and Zadar; also for those navigating this sea at a distance from its western shore. Otočić Jabuka is a barren, conical, inaccessible rock, precipitous in places; the islet is 314 feet (95^m7) high and steep-to, it is of a reddish colour and, from a distance, at times, resembles a vessel under sail. See view on chart 2712. 5

Pličina Jabuka, with a depth of 3½ fathoms (6^m4) over it, rock, and steep-to, lies about 1½ miles west-north-westward of Otočić Jabuka. 10

VIŠKI KANAL.—Viški (Vis) kanal separates Otok Vis from Pakleni otoci, which lie southward of the western end of Otok Hvar, separated from that island by Pakleni kanal, page 240. Viški kanal is about 6 miles wide in its narrowest part between Rt Stončica and the westernmost of Pakleni otoci, north-north-eastward. 15

On the southern side of Viški kanal, the northern side of Otok Vis, between Rt Barjaci, page 235, and Rt od Nove Pošte, about 6 miles east-north-eastward, is bold, steep-to and indented with a few coves; the coast is backed by high land which, near the western end, rises to Mali Hum, 1,686 feet (513^m9) high. 20

Otočić Kamik, 42 feet (12^m8) high, lies on a shallow bank extending a short distance offshore, about 3½ miles east-north-eastward of Rt Barjaci. Uvala Oključna is entered between Otočić Kamik and the north-western extremity of a peninsula, about 3 cables eastward. Between the north-eastern extremity of this peninsula and a point, 25 about 3 cables farther eastward, there are three coves of which Uvala Gradac is the easternmost. Between Uvala Gradac and Rt od Nove Pošte, the coast consists of a precipitous reddish cliff. See view A on chart 2712.

Chart 1612, plan of Vis harbour.

Hridi Volići (Telići), lie about 3 and 4½ cables, respectively, north-eastward of Rt od Nove Pošte; the outer and larger of these rocks is 10 feet (3^m0) high, and a reef extends about half a cable southward of it; the inner is 3 feet (0^m9) high, and a rock, with a depth of 3 fathoms (5^m5) over it, lies about half a cable south-south-westward 35 of it. Between this danger and the coast, south-westward, there is a clear channel about a quarter of a mile wide.

Školjić od Rogaćića, a rock, 26 feet (7^m9) high, lies close offshore about 1½ cables southward of Rt od Nove Pošte; Luka Rogaćić is entered between this rock and Rt od Kompa, about half a mile east-south-eastward. 40

Viška (Vis) luka, page 239, is entered between Rt od Kompa and Wellington point, about a mile eastward. Otočić Host, 69 feet (21^m0) high and bordered by a narrow, shallow bank at both its north-eastern and south-western ends, is separated from Rt od Kompa by a passage 45 about a cable wide, in the fairway of which there is a depth of 6 fathoms (11^m0). Hrid Kravica (Krava), 9 feet (2^m7) high and bordered by a shallow bank, except on its north-western side, lies about 6 cables eastward of Otočić Host and a quarter of a mile off Wellington point (Lat. 43° 04' N., Long. 16° 13' E.). 50

Chart 2712.

The light on Rt Stončica is obscured over all the rocks in the vicinity of Viška luka.

Charts 2712, 1440, 2158a.

Chart 2712,

Between Wellington point and Rt Stončica, about $1\frac{1}{2}$ miles eastward, the northern side of Otok Vis is bold and steep-to with several coves, Uvala Stončica being just westward of the point.

5 *Chart 1612, plan of Pakleni channel.*

- On the northern side of Viški kanal, Pakleni otoci vary in height from about 100 feet (30^m5), at the eastern end, to 315 feet (96^m0), near the western end of Otok Kliment, the central and largest island of the group. The coasts of all these islands are indented with coves ;
- 10 their southern sides are precipitous and barren, and should be given a wide berth, especially in bad weather, both on account of the outlying dangers and the strength of the current through the narrow passages between them.

- Otočici Vodnjak, two in number, lie at the western end of the group.
- 15 The larger of these is 148 feet (45^m1) high, and its summit is wooded ; its light coloured beach is conspicuous from Viški kanal. A shallow bank extends from the northern side of the islet, on which there are some smaller islets and rocks, both above-water and sunken, the positions of which can best be seen on the chart.
- 20 About a quarter of a mile south-westward of Mali Vodnjak, the north-westernmost of these islets, which is 49 feet (14^m9) high, there is a detached shoal, with a depth of $2\frac{1}{2}$ fathoms (4^m1) over it ; this is the westernmost danger of the group. The southern extremity of Otok Dobri, bearing 116° , and open southward of the southern extremity
- 25 of Otočici Vodnjak, leads southward of this shoal.

- The south-western extremity of Otok Kliment, from which a reef, with a depth of 4 fathoms (7^m3) over its outer end, extends about a cable, lies about a mile east-south-eastward of the southern extremity of Otočici Vodnjak ; Luka Soline, open westward, is entered between
- 30 Rt Kovač, about a mile farther east-south-eastward, and Rt Stražica (Strošica), about half a mile south-eastward of that point.

- Otok Dobri (Dokriotok), 170 feet (51^m8) high, lies about a cable westward of Rt Stražica, in the approach to Luka Soline ; it is connected to Rt Stražica by a bank with a depth of 4 fathoms (7^m3)
- 35 over it.

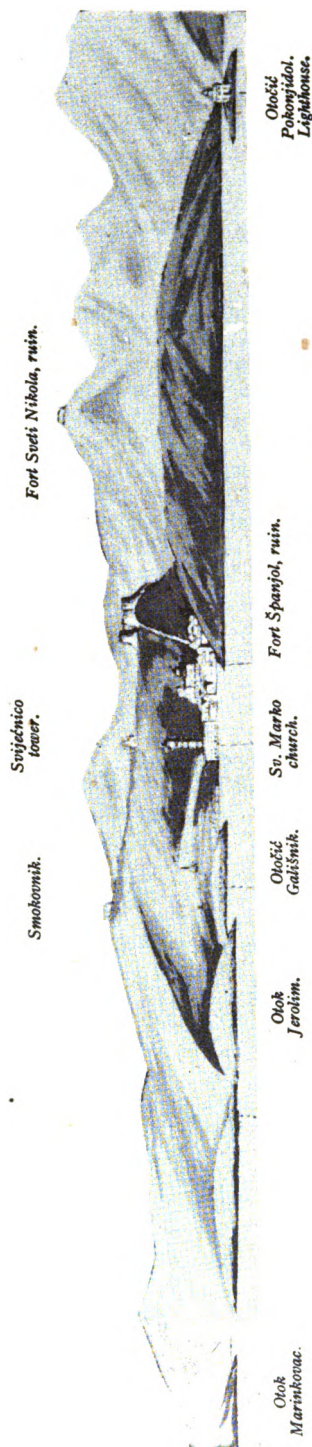
- Otočić Stambedar, 102 feet (31^m1) high, is the southernmost of the group, and lies about 7 cables east-south-eastward of Otok Dobri. This islet is steep, bare and whitish, and is the most conspicuous object on the southern side of Pakleni otoci. The southern side of Otočić
- 40 Stambedar is steep-to, but Hridi Pločice, the largest of which is about 20 feet (6^m1) high, situated close eastward, are bordered by a shallow bank ; a rocky $2\frac{1}{2}$ -fathom (4^m6) patch lies about $1\frac{1}{2}$ cables eastward of these rocks. A rocky bank, with a depth of $6\frac{1}{2}$ fathoms (11^m9) over it, lies about 4 cables eastward, and a similar bank, about half a mile
- 45 north-eastward, of the northern of Hridi Pločice.

Borovac and Planikovac, two islets, lie on a shallow bank which extends about 7 cables east-north-eastward from the southern part of the eastern end of Otok Kliment (*Lat.* $43^{\circ} 09' N.$, *Long.* $16^{\circ} 24' E.$).

- Rt Ražnjić (Rasnik), the southern extremity of Otok Marinkovac
- 50 (Sdrilca), the second largest island of the group, lies about $1\frac{1}{2}$ miles east-north-eastward of Hridi Pločice. Otok Jerolim, 105 feet (32^m0) high, the easternmost island, lies close off the eastern end of Otok Marinkovac, connected to it by a bank, with a depth of 2 fathoms (3^m7) over it. About a quarter of a mile off the southern side of Otok

Charts 2712, 1440, 2158a.

To face page 239.



Approach to Luka Hvar from southward.

(Original dated 1910.)

Chart 1612, plan of Pakleni channel.

Jerolim, there are two detached, rocky shoals, about 2 cables apart ; the western of these shoals has a depth of $3\frac{1}{4}$ fathoms (5^m9) over it, and the eastern, a depth of $4\frac{1}{4}$ fathoms (7^m8) over it. A detached, rocky shoal, with a depth of $4\frac{1}{4}$ fathoms (7^m8) over it, lies about 2 cables 5 eastward of the same island.

The church of Sveti Marko, at the head of the harbour of Hvar, in line with the tower of Svijećnice (Gospa od Krovenice), bearing 356° , leads eastward of the dangers southward of Otok Jerolim, and between that island and the $4\frac{1}{4}$ -fathom (7^m8) shoal eastward of it. See view 10 facing this page.

Otočić Pokonjido, 36 feet (11^m0) high and fringed by a narrow bank, lies about 6 cables eastward of Otok Jerolim and $3\frac{1}{2}$ cables off the southern coast of Hvar.

Chart 1612, plan of Vis harbour.

Lights.—A light is exhibited, at an elevation of 70 feet (21^m3) from a white octagonal stone tower and dwelling, 37 feet (11^m3) in height, on the north-eastern end of Otočić Host (Lat. $43^\circ 05' N.$, Long. $16^\circ 12' E.$). 15

Chart 1612, plan of Pakleni channel.

A light is exhibited, at an elevation of 67 feet (20^m4), from a tower on a white dwelling, 48 feet (14^m6) in height, on the summit of Otočić Pokonjido. See view.

Chart 1612, plan of Vis harbour.

Viška luka.—**Light.**—Viška (Vis) luka, the entrance to which is

described on page 237, is backed on all sides by high hills. The 30 rising ground around the harbour is cultivated. The small town of Vis, the population of which was, with that of Kut, 3,885, in 1931, is situated on the western side, and the village of Kut, on the eastern side, of the head of the harbour ; both places are fronted by sea walls, and off the Health office there is a short mole and farther eastward 35 a quay.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 17 feet (5^m2) in height, on Sveti Jerolim (Jere) pier, situated on the south-western side of the harbour, about a mile south-westward of Otočić Host lighthouse. 40

Anchorage.—**Mooring buoys.**—**Directions.**—The harbour is sheltered in every direction except north-eastward, and Otočić Host breaks the sea considerably, though during a Bora a considerable sea sets in ; the holding ground is good. The Scirocco blows with heavy gusts from changing directions. 45

Vessels of deep draught anchor in a depth of about 20 fathoms (36^m6), sand and gravel, a little inside the entrance, and at an equal distance from the two shores ; or farther in, abreast Sveti Jerolim, on which there is a chapel and the arsenal, in a depth of about 14 fathoms (25^m6), mud. Near the fairway, about 4 cables southward of 50 Otočić Host, there is a rocky patch, with a depth of 14 fathoms (25^m6) over it, which should be avoided when anchoring. The holding ground near the eastern and western shores is not so good as in the middle.



Otočić Pokonjido lighthouse.

Chart 1612, plan of Vis Harbour.

Vessels of shallow draught moor in the south-western part of the head of the harbour close off the town of Vis, or off Kut ; in a Bora, the best position is in Port Stonca, south-westward of Rt od Biskupa, situated about half a mile south-westward of Rt od Kompa. Boulders are available for securing hawsers in this cove and also on the eastern shore of the harbour.

Vessels moor with open hawse north-eastward. There are some mooring buoys at the head of the harbour.

- 10 On arriving off Viška luka, a chapel will be seen on an eminence at the head of the harbour, and the fortifications on the sides near the entrance, of which the highest, Fort Wellington, a ruin, elevated 584 feet (178^m0), is on the eastern side ; on a near approach, Otočić Host lighthouse and the off-lying rocks will be distinguished, and then
15 the white houses of Vis. Access is easy for a steam vessel. The current generally sets towards the rocks in the approach to the harbour.

The entrance is difficult for a sailing vessel with south-easterly winds as heavy squalls often render it impossible to carry sufficient sail. When making this harbour from eastward, it is advisable to keep at
20 a distance from the high lands to avoid the strong sudden gusts which descend from them.

Meteorological tables.—See page 28.

Chart 2712.

- Other anchorages in Viški kanal.**—On the southern side of the
25 channel, Uvala Oključna and Uvala Gradac, page 237, afford shelter to small vessels, with local knowledge, against southerly winds, and the latter cove, also partly against the Bora.

Chart 1612, plan of Vis harbour.

- Luka Rogačić, page 237, is convenient for small craft unable to reach
30 Viška luka ; the anchorage is off a cove on the southern side, in depths of about 10 fathoms (18^m3), gravel, at a distance of 2½ cables from the head of the harbour. Between this cove and the entrance, the bottom is rocky and easterly winds are felt in their full force.

Chart 1612, plan of Pakleni channel.

- 35 On the northern side of the channel, Luka Soline, page 238, affords shelter from all but westerly winds, in depths of from 14 to 18 fathoms (25^m6 to 32^m9), sand. In approaching this harbour from westward, the south-western extremity of Otok Kliment (*Lat.* 43° 10' N., *Long.* 16° 20' E.) should be given a wide berth. The telegraph cable, indicated on the chart, should be avoided when anchoring.

There is good anchorage in any weather for small craft, with local knowledge, in the area between Marinkovac, Borovac and Planikovac.

A mooring buoy, for the use of vessels up to 500 tons, is situated about half a cable eastward of Otočić Pokonjidl.

- 45 **Pakleni kanal.**—**Anchorages.**—Pakleni kanal, in the fairway of which the depths are considerable, lies between the south-western part of Otok Hvar and Pakleni otoci, and is entered, from north-westward, between Otočići Vodnjak and Rt Pelegrin, the western extremity of Otok Hvar, about 2½ miles north-eastward. The channel narrows
50 towards its eastern end, and between Otok Jerolim and Križni rat, on the coast of Otok Hvar, north-eastward, is only about 3 cables wide. Luka Hvar, page 242, is situated on the northern side near the eastern end of the channel.

Pakleni kanal is frequented by small vessels, with local knowledge,

Charts 2712, 1440, 2158a.

Chart 1612, plan of Pakleni channel.

as it is easy of access and exit with all winds and affords good shelter from the Bora, although heavy squalls are encountered. The current is strong, and with easterly winds it is difficult for a sailing vessel to beat up to an anchorage. Westerly winds are often severely felt. 5

Large vessels can anchor off the northern shore, about a mile westward of Luka Hvar, in a depth of about 22 fathoms (40^m2); farther westward, the depths are greater.

There is anchorage for small vessels in the three coves on the northern side of the channel westward of Luka Hvar and, in case of necessity, 10 under the lee of Pakleni otoci.

On the southern side of the channel, the coasts of Pakleni otoci are much indented; small vessels are sheltered against all winds in Luka Palmežana, on the northern side of the eastern end of Otok Kliment. Hrid Baba, 2 feet (0^m6) high, is situated in the approach to this harbour, about 2 cables westward of its eastern entrance point; a reef, with a depth of 3 fathoms (5^m5) at its outer end, extends about a cable north-north-eastward of Hrid Baba. Vessels moor in moderate depths, either near the eastern shore or in the south-western part of the harbour with anchor and hawsers to the shore. 20

Otočić Gojca, 33 feet (10^m1) high, lies about a cable eastward of the north-eastern extremity of Otok Kliment (*Lat.* 43° 10' N., *Long.* 16° 24' E.).

Small vessels, with local knowledge, find shelter from the Scirocco in moderate depths, between the northern end of Otok Marinkovac, 25 page 238, and Planikovac, 82 feet (25^m0) high, about a cable westward.

On the northern side of Pakleni kanal, Rt Pelegrin is steep-to, and is the western termination of the mount of that name, 492 feet (150^m0) high, which is situated three-quarters of a mile east-south-eastward of the cape. Between Rt Pelegrin and Luka Hvar, about 3½ miles 30 east-south-eastward, the coast rises in steep slopes. There are several coves in it, of which Luka Vela Grčka and Luka Mala Grčka afford shelter to small vessels against all winds and have mooring bollards; a north-westerly wind causes a heavy sea in Luka Mala Grčka. Small vessels, with local knowledge, find Uvala Pelegrinska (Pelegrin), situated on the south-eastern side of Rt Pelegrin, a convenient anchorage 35 in a Bora; the inner part of this cove and Uvala Podstine (Sabioni), about 2½ miles farther east-south-eastward, give good shelter in a Scirocco.

Otočić Gališnik, 59 feet (18^m0) high, with a battery on it, lies in the approach to Luka Hvar, about a cable west-north-westward of Križni rat, to which it is connected by a bank over which there are depths of less than 5 fathoms (9^m1). 40

Depths of less than 4 fathoms (7^m3) extend about a cable from the western side of Otočić Gališnik. 45

On the southern side of the channel, depths of less than 4 fathoms (7^m3) extend about 1½ cables north-north-westward from the north-western extremity of Otok Jerolim.

Lights.—A light is exhibited, at an elevation of 69 feet (21^m0), from a red conical iron tower on a masonry base, 36 feet (11^m0) in height, on the northern extremity of Rt Pelegrin (*Lat.* 43° 12' N., *Long.* 16° 22' E.). 50

A light is exhibited, at an elevation of 36 feet (11^m0), from a white stone tower, 29 feet (8^m8) in height, on Otočić Gališnik.

Charts 2712, 1440, 2158a.

Chart 1612, plan of Pakleni channel.

Telegraph cable.—A submarine cable, indicated on the chart, crosses Pakleni kanal from Machiedo, on the northern side of Otok Kliment, to a point on the coast of Otok Hvar, close westward of the
5 entrance to Luka Mala Grčka.

Luka Hvar.—**Light.**—Luka Hvar, situated near the eastern end of Pakleni kanal, is the only harbour of any consequence on the southern side of Otok Hvar. It is open southward, but is somewhat sheltered in that direction by Otočić Gališnik.

10 The forts of Sveti Nikola, 790 feet (240^m8) high, and Španjol (Napoleon), 355 feet (108^m2) high, both in ruins; the barracks westward of Smokovnik, a hill, 630 feet (192^m0) high; Sveti Marko church, with a reddish tower; and Sveti Frane (Franjevački) convent, southward of the town, are conspicuous. *See view facing page 239.*

15 A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 17 feet (5^m2) in height, on the southern end of the quay at Hvar (*Lat. 43° 10' N., Long. 16° 27' E.*).

Anchorage.—There is anchorage, in a depth of about 20 fathoms (36^m6), south-westward of the battery on Fabrika point, the western
20 entrance point of the harbour, with the western end of Otočić Gališnik, bearing 122°, distant about 2 cables; steam vessels can anchor, in a depth of about 12 fathoms (21^m9), south-south-westward of the town.

Medium-sized vessels can secure alongside the eastern quay, for a short distance northward of the light-structure. Smaller vessels can
25 secure to the quay on the western side of the Harbour master's office, at the head of the harbour, but this place is dangerous in southerly winds; during the latter, a recommended anchorage is in the centre of the harbour with the stern secured to the western quay.

In the harbour the Bora is very squally, but blows with relatively
30 moderate strength; the Scirocco is the strongest wind. Southerly and north-westerly winds occasionally cause a considerable sea.

Directions.—Luka Hvar can be approached from either end of Pakleni kanal. The approach from north-westward is preferable to a sailing vessel when the wind admits.

35 Approaching from north-westward, Rt Pelegrin may be seen from a considerable distance, resembling a dark hill covered with trees; shortly after Pakleni otoci will be distinguished, opening out southward and westward of the cape; and, when abreast the channel, the battery on Križni rat, Sveti Frane convent and the two towers on Fabrika
40 point will be visible before the town is sighted. Rt Pelegrin and the southern coast of Otok Hvar may be kept aboard if desirable.

If passing out of the channel through its eastern end, a vessel should steer to pass midway between the shallow banks extending from Otok Jerolim and Otočić Gališnik, northward of the 4½-fathom (7^m8) shoal
45 lying eastward of the former, and about a cable northward of Otočić Pokonjidl.

Approaching from south-eastward, the channel, between Otok Jerolim and Otočić Pokonjidl, though narrow, is convenient with easterly winds. As soon as the ruins of Fort Sveti Nikola, situated
50 about half a mile north-eastward of the light-structure on the quay at Hvar, is seen it should be steered for.

A vessel of deep draught, coming from southward, should bring Sveti Marko church in line with the tower at Sviječnice, bearing 356° (*see view facing page 239*), until the northern extremities of Otočić

Charts 2712, 1440, 2158a.

Chart 1612, plan of Pakleni channel.

Gojca and Otok Marinkovac are in line, bearing 285° ; a vessel is then northward of the $4\frac{1}{2}$ -fathom (7^m8) shoal eastward of Otok Jerolim and may steer west-north-westward for the anchorage, giving the western extremity of Otočić Gališnik (*Lat.* $43^{\circ} 10' N.$, *Long.* $16^{\circ} 26' E.$) a berth 5 of at least one cable.

A vessel coming from eastward should pass about a cable northward of Otočić Pokonjido and north-eastward of the $4\frac{1}{2}$ -fathom (7^m8) shoal lying eastward of Otok Jerolim and round Otočić Gališnik as directed above. 10

A steam vessel leaving Luka Hvar must not pass through the channel eastward of Otočić Gališnik.

Town.—The town of Hvar, which had a population of 1,830, in 1931, is situated on the north-eastern side of the harbour, and is lined with quays along the whole sea front; vessels drawing 18 feet (5^m5) 15 can lie alongside. There are two small moles for the use of coasters.

Fresh provisions and water can be obtained.

There is regular steamer communication with Dubrovnik, Split and Trieste.

Chart 2712.

OTOK HVAR.—This island is one of the largest and most populous 20 of the islands of Yugoslavia, from the coast of which its eastern end lies about $2\frac{1}{2}$ miles. The western part of its northern coast is much indented, but the eastern part is almost straight. Nearly the whole of the southern side rises abruptly, a range of mountains at a short 25 distance from the coast extending from its western end more than two-thirds of its length. Sveti Nikola chapel stands on the summit of this range at an elevation of 2,053 feet (625^m8), about 11 miles eastward of Rt Pelegrin and half a mile inland.

Sveti Juraj church (*Lat.* $43^{\circ} 08' N.$, *Long.* $16^{\circ} 57' E.$), elevated 30 1,184 feet (360^m9), stands on the southern slope of a mountain, 1,329 feet (405^m1) high, about 11 miles from the eastern end of the island and $1\frac{1}{2}$ miles from the southern coast; the heights decline gradually in that direction. The higher portions of the island present the bare and sterile appearance common in these parts; the northern slopes are 35 cultivated and there are woods and pastures on them.

There are numerous villages besides the town of Hvar. The island has several good anchorages in Bora gales.

Otok Hvar is said to have the most equable climate in the Adriatic except Vlonë. 40

KORČULANSKI KANAL.—**General description.**—Korčulanski (Korčula) kanal is situated between Otok Hvar, on its northern side, and Otok Korčula, on its southern side. At its eastern end, Neretvanski kanal is entered northward of Poluotok Pelješac. Otok 45 Šćedro, with Hridi Lukavci westward of it, lies on the northern side of the channel, separated from Otok Hvar by Šćedarski kanal, and Otok Pločica lies on the southern side of mid-channel farther eastward.

Small vessels, with local knowledge, usually hug the northern side of the channel, passing northward of Otok Šćedro, especially when anticipating contrary winds, so as to be able to anchor, if necessary, 50 in Luka Lovište (Šćedro).

Channel.—On the northern side of Korčulanski kanal, the southern

Charts 1440, 2158a.

Chart 2712.

coast of Otok Hvar from abreast Otočić Pokonjidl to the western entrance point of Uvala Smrska, about 23 miles eastward, is moderately steep-to and is backed by high land. Small vessels, with local knowledge, find shelter in Uvala Milna, situated close eastward of Rt Debeli rat, about a mile eastward of Otočić Pokonjidl.

Šćedarski (Šćedro) kanal, page 245, is entered from westward between Rt Donji (Zapadni), the western extremity of Otok Šćedro, situated 10 miles east-south-eastward of Otočić Pokonjidl, and the coast of Otok Hvar northward.

Otok Šćedro, covered with bushes and willows, is 370 feet (112^m8) high at its western end and 262 feet (79^m9) high at its eastern end. A narrow bank, with depths of less than 5 fathoms (9^m1) over it, fringes the eastern end of the island. Small vessels, with local knowledge, in a Bora, can anchor in one or other of the coves on the southern side, but there is no anchorage for large vessels on this side of the island.

Hridi Lukavci lie about 3½ miles westward of Otok Šćedro; the north-western and larger of these two rocks is 16 feet (4^m9) high and the other is 19 feet (5^m8) high. The shallow bank which connects them extends about 3½ cables north-eastward of the south-eastern rock, where there is a depth of 2 fathoms (3^m7). A detached, rocky patch, with a depth of 4½ fathoms (8^m2) over it, lies about 3½ cables west-north-westward of the north-western rock. During easterly winds, the current sets strongly in the vicinity of these rocks.

Hridi Lukavci are covered by the *red* sector of the light near the western end of Otok Šćedro, between the bearings of from 087° to 094°.

On the southern side of Korčulanski kanal, the northern coast of Otok Korčula from its western extremity to Luka Račišće, page 230, is hilly, sparsely inhabited and covered with trees. The coast is bold, with several coves, but affords no shelter for large vessels. There are no sunken dangers except a rock, with a depth of 6 feet (1^m8) over it, lying close off Rt Prihodišće, about 12 miles eastward of Otočić Proizd light-tower (*Lat.* 42° 59' N., *Long.* 16° 36' E.).

Coasting craft seldom approach this coast as with northerly winds it is a dead lee shore.

A shallow spit extends 3 cables northward from the bank which connects Otočić Proizd, page 225, with Otok Korčula; Hrid Prvi lies near the end of this spit and Hrid Izvanjski (Škoji), 19 feet (5^m8) high, lies detached, about 2 cables farther northward.

Hrid Gorčik, 23 feet (7^m0) high, lies about 1½ miles eastward of Hrid Izvanjski and 2 cables offshore, in the approach to Uvala Meja.

Uvala Prigradica, with a white tower, which serves as a mark, on the summit of its western entrance point, is situated about 7 miles east-south-eastward of Hrid Gorčik. A mole, partially in ruins, projects about 120 yards (109^m7) in a north-westerly direction from the south-eastern side of this cove, inside which small craft may find shelter.

Hridi Naplovci (Naplovac), the western of which is 19 feet (5^m8) high, and the eastern 16 feet (4^m9) high, lie from 6 to 9 cables eastward of the light-structure at Uvala Prigradica and about 2 cables offshore; and Hrid Blaca, 16 feet (4^m9) high, lies close offshore about 1½ miles farther east-south-eastward. Prigradica light is obscured over Hridi Naplovci.

Charts 1440, 2158a.

Chart 2712.

Rt Prihodišće, close off which there is a sunken rock, already mentioned, lies about a mile east-north-eastward of Hrid Blaca.

In case of necessity during a Bora, small craft can find shelter in Uvala Rasoha (Rosoka), about a mile east-north-eastward of Rt Prihodišće, with a hawser to the shore, or under the lee of Hridi Naplovci.

Otok Pločica lies with its north-western extremity about 4 miles northward of the light-structure at Uvala Prigradja; the islet is 43 feet (13^m1) high, and another islet lies close off its south-eastern end, both being surrounded by a narrow, shallow bank. A sunken rock, which breaks, lies close south-eastward of the south-eastern islet. Otok Pločica should not be approached too closely.

Lights.—The light on Rt Proizd is described on page 225.

A light is exhibited, at an elevation of 68 feet (20^m7), from a red circular iron tower on a masonry base, 32 feet (9^m8) in height, near the western end of the southern side of Otok Šćedro, 3½ cables south-eastward of Rt Donji (*Lat.* 43° 05' N., *Long.* 16° 40' E.).

A light is exhibited, at an elevation of 112 feet (34^m1), from a tower on a dwelling, 82 feet (25^m0) in height, on the north-western end of Otok Pločica.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 16 feet (4^m9) in height, on the head of the mole at Uvala Prigradja.

The light on Rt Lovište is described on page 233.

Šćedarski kanal.—**Light.**—The entrance to Šćedarski kanal is described on page 244. The channel is deep and clear of dangers at a distance of 2 cables from either shore. Easterly winds greatly accelerate the west-going current.

On the southern side of the channel, the northern coast of Otok Šćedro is indented. Depths of less than 4 fathoms (7^m3) extend about a cable off a point, situated about 4 cables north-eastward of Rt Donji.

Uvala Maslinica is entered between a point about three-quarters of a mile north-eastward of Rt Donji and a point, about 3 cables farther eastward. A 5-fathom (9^m1) patch lies close off the western entrance point, and a 2½-fathom (4^m6) shoal close off the eastern entrance point of this cove.

Luka Lovište (Šćedro) is situated near the middle of the northern side of Otok Šćedro; small vessels can find shelter in two creeks at the head of this harbour. The two entrance points are of a whitish colour. Coasters also anchor in Uvala Manastir (Master) eastward of Luka Lovište.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column, 10 feet (3^m0) in height, situated on the eastern entrance point of Luka Lovište.

Charts 2712, 2713.

NERETVANSKI KANAL.—**General description.**—Neretvanski (Neretva) kanal is a continuation eastward of the northern part of Korčulanski kanal and is entered between Rt Lovište, page 233, and the western entrance point of Uvala Smrska, page 244, about 5 miles north-north-westward. The channel is clear of dangers at a distance of 2 cables offshore. About 10 miles eastward of its entrance, between the eastern end of Otok Hvar and the mainland, 2½ miles

Charts 1440, 2158a.

Charts 2712, 2713.

north-eastward, it is connected to the channel leading to Hvarski kanal and Brački kanal north-westward; Reka Neretva flows into the north-eastern side of Neretvanski kanal about 12 miles farther south-eastward. At its south-eastern end, the channel leads into Zaliv Klek, on the north-eastern side, and also into Kanal Malog Stona.

It is advisable when proceeding up this channel, especially with northerly and easterly winds, to keep near the coasts of Otok Hvar and the mainland, where a favourable counter current will usually be met, as the coast of Poluotok Pelješac is iron-bound and without shelter. Reka Neretva causes a strong west-going current, especially in the rainy season, when the water is frequently discoloured as far as the entrance of the channel.

Telegraph cable.—A submarine cable, indicated on chart 2712, crosses Neretvanski kanal from Rt Lovište to Uvala Smrska.

Channel.—The northern side, between Uvala Smrska and Rt Sućuraj, the eastern extremity of Otok Hvar, about 10 miles eastward, is indented with coves, and is moderately steep-to. A $5\frac{1}{2}$ -fathom (9^m1) patch lies about 2 miles west-south-westward of Rt Sućuraj and close offshore; from abreast this patch to Rt Sućuraj, the coast is fringed by a narrow bank, with depths of less than 5 fathoms (9^m1) over it.

Large vessels can find shelter in northerly winds under the coast between Uvala Smrska and Uvala Mertinovik, about $4\frac{1}{2}$ miles eastward, in depths of from about 18 to 25 fathoms (32^m9 to 45^m7), sand and mud, from 2 to $2\frac{1}{2}$ cables offshore. Small vessels, with local knowledge, can anchor in Uvala Smrska, Uvala Duboka, Uvala Kozja (Košja), situated $2\frac{1}{2}$ and 3 miles, respectively, eastward of Uvala Smrska, and in Uvala Mertinovik.

The harbour of Sućuraj, situated about 4 cables westward of Rt Sućuraj, is formed by a small mole which affords shelter to coasters; near the inner end of the mole, there is a tower. Small craft, with local knowledge, can secure alongside the quay eastward of a small jetty on the northern side of the harbour. Continuous northerly winds cause the depths in the harbour to decrease and, if mooring within the mole, this should be considered. Easterly winds blow strongly into the harbour.

Rt Sućuraj is low and narrow and has a lighthouse and a chapel on it; it is steep-to.

The whole of the southern side of Neretvanski kanal from Rt Lovište (*Lat.* $43^\circ 03' N.$, *Long.* $17^\circ 00' E.$) is high, wooded and, with two exceptions, steep-to. Rt Lovište is lower and less steep than the rest of the coast, but the land, at a distance of $4\frac{1}{2}$ miles south-eastward of it rises to a height of 1,315 feet (400^m8) and, about 2 miles farther east-north-eastward is Velika Dolina, a mountain, 2,474 feet (754^m1) high. The summit of Poluotok Pelješac, Vipera (Mount Sveti Ilija), 3,153 feet (961^m0) high, standing about $1\frac{1}{2}$ miles south-eastward of Velika Dolina, is a conspicuous hummock.

The northern side of Rt Lovište is bordered by a shallow, rocky bank, extending about 3 cables offshore. Rt Duba, on which there is a chapel, lies $7\frac{1}{2}$ miles east-south-eastward of Rt Lovište and is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 2 cables wide; a detached 4-fathom (7^m3) patch lies about a mile eastward of Rt Duba and 2 cables offshore.

Charts 1440, 2158a.

Charts 2712, 2713.

There is a small artificial harbour at Rt Duba where small craft, drawing from 8 to 10 feet (2^m4 to 3^m0), can shelter during a Bora or southerly winds.

Divna cove, with an islet close off its western entrance point, is situated about 1½ miles eastward of Rt Duba; Trpanj, where there is a small harbour, lies about 2½ miles farther east-south-eastward. A detached shoal, with a depth of 2 fathoms (3^m7) over it, lies about half a mile westward of the harbour at Trpanj and a quarter of a mile offshore; midway between this shoal and the harbour, there is a 5½-fathom (10^m1) patch.

There are several small coves in the stretch of coast just described, completely exposed to north-easterly winds, and a few villages of which the chief, Trpanj and Duba, can be distinguished by their church steeples.

Chart 2713.

The harbour at Trpanj is sheltered from north-eastward by a break-water. On the southern shore, there is a boat harbour formed by two moles, the eastern of which extends offshore in a north-north-westerly direction, and the western in a northerly and then easterly direction. The bottom is sand, but bollards are available. Vessels drawing up to 10 feet (3^m0) can lie alongside the mole on the eastern side of the boat harbour.

Outside the harbour, the holding ground of mud is good, but there, a vessel is exposed to the Bora and Scirocco, which are strong. From eastward, the village, which contained 800 inhabitants, in 1931, is hidden by a ridge on which there are two chapels.

On the north-eastern side of Neretvanski kanal, Uvala Zaoztrog, the entrance to which is about three-quarters of a mile wide, lies south-eastward of a point situated about 3½ miles east-north-eastward of Rt Sućuraj; there is a mole in this bay to which small craft, drawing up to 11 feet (3^m4), can secure. Southward of the mole, the bottom consists of mud, good holding ground. Between Uvala Zaoztrog and the mouths of Reka Neretva, the coast is backed by high land with steep slopes, the highest peak being that of Sveti Ilija, elevated 2,526 feet (769^m9) and situated about 5 miles south-eastward of the north-western entrance point of Uvala Zaoztrog. The town of Gradac, where there is a small harbour protected from south-westward by a mole, lies on the coast about 1½ miles west-north-westward of this peak. This town contained 1,200 inhabitants, in 1931.

There are depths of from 6 to 14 feet (1^m8 to 4^m3) in the harbour at Gradac, but it can only accommodate coasters. Vessels 130 feet (39^m6) long, drawing up to 11 feet (3^m4), can secure to the inner side of the outer end of the mole. Large vessels can anchor southward of the town, in depths of from 14 to 16 fathoms (25^m6 to 29^m3).

Charts 2712, 2713.

Lights.—The light on Rt Lovište is described on page 233.

A light is exhibited, at an elevation of 48 feet (14^m6), from a stone tower, 45 feet (13^m7) in height, on Rt Sućuraj (*Lat.* 43° 07' N., *Long.* 17° 12' E.).

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 9 feet (2^m7) in height, on the head of the mole in the harbour of Sućuraj.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron

Charts 1440, 2158a.

Charts 2712, 2713.

column, 15 feet (4^m6) in height, on the head of the mole in the harbour of Gradac.

A light is exhibited, at an elevation of 24 feet (7^m3), from a pyramidal iron tower, 23 feet (7^m0) in height, on the head of the breakwater at Trpanj.

A light is exhibited, at an elevation of 16 feet (4^m9), from a grey metal column, on the head of the eastern mole at Trpanj.

Chart 2713.

- 10 **Channel.—Beacon.**—On the north-eastern side of Neretvanski kanal, Uvala Žrnovica is situated about 1½ miles south-south-eastward of Gradac; between Uvala Žrnovica and Rt Višnjica (Višnica), about 3½ miles farther south-eastward, the land is considerably lower than that previously described on this side of the channel. Rt Višnjica, 15 high and bluff, is the south-eastern termination of a peak of the same name, which is 800 feet (243^m8) high. Some villages and chapels can be seen near the coast and the lower slopes are wooded and, in places, cultivated. The coast is steep-to, except for a rock, with a depth of one fathom (1^m8) over it, lying about 1½ miles north-westward of 20 Rt Višnjica and close offshore.

Chart 1582, plan of approaches to Ston Mali and Klek bay.

- Luka Ploče, page 250, lies close eastward of Rt Višnjica; and the delta of Reka Neretva, page 251, extends from that point to 25 Osinj, a rocky islet, lying one cable offshore, about 2½ miles south-eastward.

- Osinj (*Lat. 43° 00' N., Long. 17° 28' E.*) is covered with brushwood and has two conical peaks, the southern peak being 249 feet (75^m9) high and showing up well against the land behind it. On the northern side of the narrowest part of the islet, is the church of Sveti Ivan. The 30 islets of Veliki Gubovac and Mali Gubovac, lie about a cable off its western side, with depths of from 8 to 10 fathoms (14^m6 to 18^m3) in the fairway of the channel between.

- Between the southern end of Osinj and the coast, 4 cables eastward, there is a chain of four islets. Blaca bay, on the south-eastern side of 35 Osinj, is small and sheltered and is entered between the second and third of these four islets. The two eastern islets lie on a shallow bank which extends in a north-westerly direction across the bay. On the north-eastern side of this bank, there is a confined space where small vessels, with local knowledge, can anchor in depths of from 4 to 5 40 fathoms (7^m3 to 9^m1). This bay is liable to silt.

- On the south-western side of Neretvanski kanal, Uvala Crkvice is situated about 5½ miles east-south-eastward of Trpanj; there is a small breakwater here which shelters coasters. Small craft, drawing up to 8 feet (2^m4), can secure to the inner side of the breakwater. In 45 Uvala Osobljava, three-quarters of a mile farther south-eastward, there is a small quay alongside which vessels, drawing up to 7 feet (2^m1), can secure.

Rat point (*Lat. 42° 57' N., Long. 17° 27' E.*) lies about 3½ miles east-south-eastward of the harbour of Crkvice.

- 50 On the north-eastern side of the channel, between Blaca bay and the entrance to Zaliv Klek, about 5 miles south-eastward, the coast is steep and rocky, backed by high mountainous land, with a church, and dwellings here and there. Uvala Duba and Uvala Soline, situated 1½ and 2½ miles, respectively, south-eastward of Blaca bay,

Charts 2713, 1440, 2158a.

Chart 1582, plan of approaches to Ston Mali and Klek bay.

afford shelter, and there is anchorage off this stretch of coast at a distance of from 5 to 8 cables offshore.

On the south-western side of the channel, between Rat point and Rt Blaca, about $3\frac{1}{2}$ miles south-eastward, there is a bight, encumbered with islets, rocks, and shoals, which have deep channels between them.

Otočić Gojak, 30 feet (9^m1) high, lies in the north-western approach to this bight, about half a mile east-north-eastward of Rat point; a bank, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, extends about a cable from the south-western side of this islet. Between Rat point and the eastern entrance-point of Slinivac bay, about $2\frac{1}{2}$ miles south-eastward, the western shore of the bight is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as 4 cables wide in places. Otočić Srednjak, 33 feet (10^m1) high, and Otočić Gospin, 55 feet (16^m8) high, lie on this bank about $2\frac{1}{2}$ cables eastward and $2\frac{1}{2}$ cables south-eastward, respectively, of Rat point. A beacon, consisting of a stone obelisk, 10 feet (3^m0) high, and painted with red and black bands, stands on the same bank, in a depth of $1\frac{1}{2}$ fathoms (2^m7), on Plićina Sreser, about 2 cables east-south-eastward of Gospin.

Rt Blaca projects north-westward and has a lighthouse on it. Otočić Pučenjak, 88 feet (28^m8) high, lies about 9 cables west-north-westward of Rt Blaca; a reef, with a depth of 2 feet (0^m6) over its outer edge, extends about $1\frac{1}{2}$ cables eastward of this islet. The positions of the other islets and shoals in this bight can best be seen on the chart. At night, Rt Blaca light in sight, bearing more than 127° , ensures passing north-eastward of the islets and dangers in the bight.

The harbour of Drače, sheltered north-eastward by two moles at right angles, is situated about $1\frac{1}{2}$ miles southward of Rat point and can only be used by coasters. Small vessels can anchor eastward of the harbour towards the southern end of Otočić Galičak, 108 feet (32^m9) high, lying about a mile east-north-eastward of Drače harbour, but are there exposed to the Bora. Vessels, drawing up to 11 feet (3^m4), can berth along the western side of the northern mole.

Brijesta (Briesta) bay, situated at the south-eastern end of the bight, is sheltered eastward by a promontory extending north-westward and terminating in Rt Blaca. Large vessels can anchor at a distance of about 4 cables south-south-eastward of Rt Blaca, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), mud, good holding ground, about 2 cables offshore; small vessels can anchor in the inner part of the bay, in a depth of 7 or 8 fathoms (12^m8 or 14^m6), mud. Vessels approaching from north-westward should give Otočić Pučenjak a berth of $2\frac{1}{2}$ cables; Stena Tajan, an islet, situated with its northern extremity about 2 cables south-eastward of Otočić Pučenjak, is steep-to. The village of Brijesta, in which there are two churches, lies at the head of the bay.

Kanal Malog Stona (Ston Mali), page 254, is entered between Rt Blaca and Rt Klek, about $1\frac{1}{2}$ miles east-north-eastward.

Chart 1582, plan of Luka Ploče and entrance to Reka Neretva.

Lights.—**Light-buoy.**—A light-buoy, exhibiting a white flashing light, every six seconds (flash, one second), is moored on the south-western edge of Plićina Gumanac, about a mile southward of Rt Višnjica (Lat. $43^\circ 02' N.$, Long. $17^\circ 25' E.$).

Charts 2713, 1440, 2158a.

Chart 1582, plan of Luka Ploče and entrance to Reka Neretva.

A light is exhibited, at an elevation of 13 feet (4^m0), from a red iron framework structure, 10 feet (3^m0) in height, on the head of the northern mole at the entrance of Reka Neretva (*Lat.* 43° 01' N., *Long.* 17° 5 27' E.).

Leading lights are exhibited at the mouth of Reka Neretva; the rear light, at an elevation of 27 feet (8^m2) from an iron beacon, surmounted by a red ball, 21 feet (6^m4) in height, situated on the head of the spur extending south-eastward from the southern mole about 10 1½ cables east-north-eastward of its head; the front light is exhibited, at an elevation of 15 feet (4^m6), from a movable iron structure, 13 feet (4^m0) in height, surmounted by a red ball, on rails, about half a cable westward of the rear light. These lights, in line, lead through the entrance.

15 Chart 1582, plan of approaches to Ston Mali and Klek bay.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 17 feet (5^m2) in height, on the head of the breakwater at Uvala Crkvice.

A light is exhibited, at an elevation of 55 feet (16^m8), from a square stone tower on a dwelling, 43 feet (13^m1) in height, on Rt Blaca. See view.

20

25

*Rt Blaca lighthouse.**Chart 1582, plan of Luka Ploče and entrance to Reka Neretva.*

Luka Ploče.—Lights—The western side of Luka Ploče (Aleksandrova)

is formed by the promontory of which Rt Višnjica is the south-eastern extremity; part of the eastern side is formed by the low broken coast of the delta of Reka Neretva. The shallow bank, caused by the deposit of mud from that river, reaches almost across the entrance channel, leaving a passage only about a quarter of a cable wide.

Plićina Gumanac is the south-western portion of the bank just mentioned, and is marked by the light-buoy previously described. A rubble dam, with five gaps in it, has been built on this bank from the northern mole of Reka Neretva to the south-western corner of Plićina Gumanac, one mile west-north-westward, whence it continues northward for a distance of about 1½ miles.

The passage into Luka Ploče passes eastward of Otočić Gubavac, a short distance within the entrance, and then close off the coast westward, past Rt Bat, situated half a mile north-north-eastward of Rt Višnjica. This part of the channel is buoyed. Within, there is a land-locked basin, protected southward by the delta of Reka Neretva.

Otok Ploča, 39 feet (11^m9) high, is situated on a shallow bank lying half a cable south-eastward of the extremity of a small promontory on the north-western side of the harbour, and lies about 6 cables northward of Rt Bat; about three-quarters of a cable northward of Otok Ploča and close offshore, there is an above-water rock. Uvala Poljuča lies westward of the promontory.

A light is exhibited, at an elevation of 42 feet (12^m8), from an iron hut, 16 feet (4^m9) in height, on the south-eastern side of Rt Višnjica.

Charts 1440, 2158a.

Chart 1582, plan of Luka Ploče and entrance to Reka Neretva.

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron hut, 16 feet (4^m9), on the western side of Uvala Poljuča, about 1½ cables north-westward of Otok Ploča (*Lat. 43° 03' N., Long. 17° 26' E.*).

Anchorage.—Vessels can anchor westward or north-north-eastward of Ploča, in depths of from 6½ to 8 fathoms (11^m9 to 14^m6), or in the entrance, south-south-westward of Rt Bat, in a depth of 3½ fathoms (6^m9); a hawser is always taken to the shore.

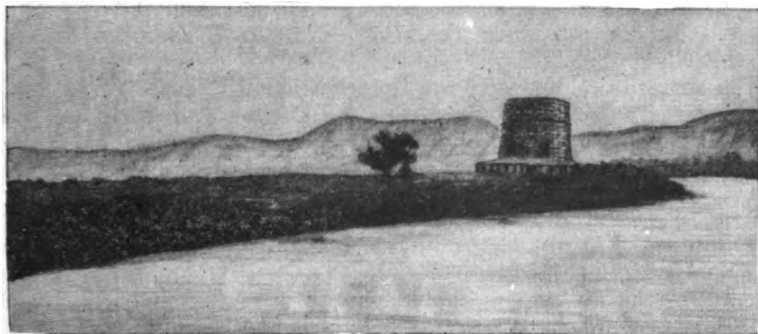
There is a wharf, about 2 cables long, on the eastern side of the southern end of Luka Ploče, which is available for vessels drawing 10 28 feet (8^m5). This wharf is connected to the railway system.

Pilotage.—Pilotage is compulsory.

Chart 1582, plan of approaches to Ston Mali and Klek bay.

Reka Neretva.—This river, one of the largest in Yugoslavia, rises in the mountains at a considerable distance inland, and, after receiving 15 many tributaries, flows past the town of Metković, about 11 miles from its mouth. From Metković, it traverses marshy country and flows into the sea about 2 miles south-eastward of Rt Višnjica between long embankments and moles.

The Bora blows very strongly in the river valley; its force is felt 20 most in the vicinity of Norinska tower, about 7 miles eastward of the mouth. During the fine season, a breeze blows out of the valley in the



Norinska tower.

(Original dated prior to 1919.)

forenoon and a sea breeze generally sets in in the afternoon. See page 15.

The bed of the river is sand at its mouth and farther up, tenacious 25 mud, except between Norinska tower and Metković, where there are boulders. The current has a normal rate of from 2 to 2½ knots, but in the rainy season it may increase to from 4 to 5 knots, and, in exceptional cases, 7 knots.

Pilots.—A pilot can be obtained by communicating with the light- 30 house keeper.

In 1938, sailing vessels of 220 tons and steam vessels having a length not exceeding 230 feet (70^m1) and a draught of not more than 12 feet (3^m7), were permitted to enter the river without a pilot. Vessels of greater tonnage were permitted to enter only at the discretion of the 35 Port Authority.

Charts 1440, 2158a.

Chart 1582, plan of Luka Ploče and entrance to Reka Neretva, and plan of approaches to Ston Mali and Klek bay.

Entrance.—Beaconage.—The lights at the entrance of Reka Neretva are described on page 250.

- 5 A low tongue extends about half a mile west-south-westward from the head of the southern mole, and a shallow bank, about a quarter of a mile wide, lies on the northern side of this tongue. The northern side of the shallow bank is marked by three black conical buoys, each surmounted by a cone. This bank is subject to change. A conspicuous stone cross stands about $1\frac{1}{4}$ cables northward of Galicak hill, 115 feet (35^m0) high, situated about three-quarters of a mile east-north-eastward of the head of the southern mole. A hut, painted green and surmounted by a cone point down, is situated on the head of the southern mole; and a hut, painted red and surmounted by
15 a framework ball, is situated on the head of the northern mole; the latter hut is in telephonic communication with Opuzen, about 6 miles from the mouth, and with Metković.

Anchorage.—Neretva anchorage lies between the mouth of the river and Osinj, page 246 (*Lat.* $43^\circ 00' N.$, *Long.* $17^\circ 28' E.$) and has
20 depths of from 7 to 14 fathoms (12^m8 to 25^m6), mud. A berth can be taken up, in depths of from 10 to 14 fathoms (18^m3 to 25^m6), with the head of the southern mole bearing 304° , distant $5\frac{1}{2}$ cables.

Depths.—There is a depth of 2 fathoms (3^m7) over the bar; vessels which can cross it, can ascend the river as far as Metković. Small
35 vessels that can pass under the bridge at Metković can proceed as far as the village of Vido.

The depth in metres is shown to vessels about to enter, on a blackboard raised 9 feet (2^m7) above the head of the southern mole; near the inner light-structure on this mole, another similar blackboard
30 shows the depths over the shallows in the river; the depths are also shown on a blackboard at Metković, a cable westward of the light on the quay.

Dangers.—Lights.—Beacons.—About $2\frac{1}{2}$ miles within the entrance a bank, on the north-western side of the river, extends about
35 a third of the way across and is marked by a beacon on each end; these beacons are left on the port hand when ascending.

The Mala Neretva river branches off southward at the eastern end of the quay at Opuzen, and here a bank extends about a third of the way across the river from this side. A black conical buoy is moored on this
40 bank close east-north-eastward of the light-structure on the quay at Opuzen.

There are other shallow banks in places extending from both sides of the river which may be distinguished by the still water.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron
45 column, 17 feet (5^m2) in height, on the eastern corner of the quay at Opuzen.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column, 15 feet (4^m6) in height, on the quay at Metković.

Directions.—Steam vessels must proceed at a speed not exceeding
50 7 knots in the river to avoid damage to the embankments.

The fairway is northward of the black buoys marking the bank on the southern side of the entrance channel and on the line of the leading light-structures, page 250. The depths are subject to change and it is not prudent to enter without local knowledge.

Charts 2713, 1440, 2158a.

Chart 1582, plan of Luka Ploče and entrance to Reka Neretva, and plan of approaches to Ston Mali and Klek bay.

From a position about a cable south-westward of Pličina Gumanac light-buoy, a vessel should steer towards the head of the northern mole to bring the leading light-structures in line, and keep them so; round the head of the northern mole at a distance of about 50 feet (15^m2) and then enter the river. Both entering and leaving, the strength of the current must be guarded against.

When leaving the river entrance, the head of the southern mole should be rounded at a distance of about 65 feet (19^m8).

Chart 1582, plan of approaches to Ston Mali and Klek bay.

Towns.—Quays.—Telegraph cable.—The village of Komin gornji (*Lat.* 43° 02' N., *Long.* 17° 33' E.), which had a population of 1,100 in 1931, lies on the north-eastern side of the river, about 4½ miles from the entrance. There is a quay at Komin gornji with a depth of 15 6 feet (1^m8) alongside.

Vessels drawing 10 feet (3^m0) can secure alongside the quay at Opuzeri; this town had a population of 850, in 1931.

At Metković, the quay on the northern side of the river is about 4½ cables long, with depths of 13 feet (4^m0) alongside; that on the southern side is about one cable long, with depths of 8 feet (2^m4) alongside. Below the quay on the northern side, there are some wooden pontoons.

Metković, which had a population of 6,900 in 1931, is connected to the general railway system. A limited supply of provisions can be obtained. Malaria is prevalent.

A bridge crosses the river a short distance above Metković.

A submarine cable, indicated on the chart, crosses the river a short distance above Komin gornji.

Zaliv Klek.—Anchorage.—Zaliv Klek is entered, at the south-eastern end of Neretvanski kanal, between Rt Klek, page 249, and a point, about 4 cables north-westward. Rt Klek, which is fringed by a narrow shallow bank, is the termination of a narrow peninsula extending north-westward from the north-eastern side of Kanal Malog Stona; this peninsula is 430 feet (131^m1) high, about a mile south-eastward of Rt Klek. The north-western entrance point of Zaliv Klek is steep-to. Within the entrance, which is open westward, there is a small bay on each side; the eastern entrance points of these bays approach each other from opposite shores, forming an inner entrance. Close off the northern inner point lies Montekukoli-klek rock, 36 feet (11^m0) high and connected to the shore by a shallow bank; a short distance off the southern inner point, there is a low above-water rock, called Lapota, which is connected with the shore south-eastward by a shallow bank.

There are no sunken dangers within the bay; it is an excellent harbour for vessels of the deepest draught.

The old Nonković tower stands on the north-eastern side of the bay, near the coast, northward of Montekukoli-klek rock, and Fort Smerdan, a ruin, is situated on a steep slope, about half a mile north-north-eastward of the tower. On the same side of the bay, a steep ridge of hills, called Grabostak, rises to a height of 1,197 feet (364^m8), about 4 cables inland. About a mile from the head of the bay, on its north-eastern side, there are two landing places or wharves, and the village of Neum, where there is a health office. At the head of the bay, there is another tower called Nonković.

Charts 2713, 1440, 2158a.

Chart 1582, plan of approaches to Ston Mali and Klek bay.

Large vessels can anchor westward of Neum in the middle of the bay, in a depth of 13 fathoms (23^m8), mud, or nearer that place if necessary, in about the same depth. Small vessels, in a Bora, anchor close under the northern shore of Uvala Duboka, close within the entrance to Zaliv Klek, or in the small bay close north-eastward of Montekukoli-klek rock (*Lat.* 42° 56' N., *Long.* 17° 34' E.), with a hawser to the shore, where there are mooring bollards; these are also found at Neum, but almost everywhere suitable boulders are available for hawsers. In the Scirocco, small vessels lie best in the south-eastern part of the bay.

Neum is free from malaria. A vessel entering should keep towards Montekukoli-klek rock so as to avoid Lopata rock on the opposite side. Sailing vessels, unable to enter in a Bora, should make for Brijesta bay, page 249.

KANAL MALOG STONA.—General description.—Anchor-age.—Kanal Malog Stona (Ston Mali) is a continuation southward of Neretvanski kanal; its entrance is described on page 249, and it ends at the head of Uvala Kuta, about 10½ miles south-eastward. For a distance of about 5 miles from the entrance, the channel is deep and clear of dangers, with a muddy bottom, and vessels of deep draught may safely anchor in any part; but the narrowness of the channel, and the frequency of violent Bora gales render its navigation difficult for sailing vessels.

Nedilja point, situated about 5½ miles south-eastward of Rt Klek, is the north-western extremity of a tongue of land projecting from Poluotok Pelješac; this tongue narrows the channel to a width of about 2 cables, between Rt Čeljen, at the south-eastern end of the tongue of land, and the coast north-eastward.

Bjelevica bay is entered between Nedilja point and Duba point, about half a mile south-westward; the coast on the south-western side of the entrance to this bay is flat, with olive trees on it, and is bordered by a bank, with depths of less than 4 fathoms (7^m3) over it, about 2 cables wide, from 3 cables north-westward to 6 cables south-eastward of Duba point.

Bjelevica bay affords good shelter, in depths of from 6 to 8 fathoms (11^m0 to 14^m6) southward of Nedilja point.

Otok Banja, 30 feet (9^m1) high, and covered with shrubs and trees, is situated in mid-channel, about 3 cables south-eastward of Rt Čeljen; this island is surrounded by a shallow bank which extends about 2 cables from its south-eastern end.

Zaliv Bistrina is entered, on the north-eastern side of the channel, between a point about 3 cables eastward of Otok Banja and a point about 2½ cables farther eastward. An islet, 5 feet (1^m5) high, lies close off the western entrance point of this bay. Anchorage in the bay is prohibited on account of oyster beds.

Between Rt Čeljen and Rt Mirna, three-quarters of a mile south-south-eastward, the south-western side of Kanal Malog Stona is indented. The village of Hodilje is situated close southward of Rt Mirna.

Otok Života, covered with woods above which a conspicuous chimney can be seen, lies on the north-eastern side of the channel, close off the north-western end of a projection, about 2½ cables north-eastward of Rt Mirna.

Charts 2713, 1440, 2158a.

Chart 1582, plan of approaches to Ston Mali and Klek bay.

From abreast Rt Mirna to abreast Rt Mali Voz, on the north-eastern side of the channel, about a mile south-eastward, the depths decrease considerably; the channel here is foul in places, and is only available for vessels drawing 10 feet (3^m0) and less. Pličina Greda, 5 with a least depth of 1½ fathoms (2^m7) over it, lies, from 2 to 3 cables eastward of Rt Mirna, on the north-eastern side of the channel and a short distance from the north-eastern shore.

A vessel should not navigate this portion of the channel without local knowledge. 10

Between Rt Mirna and Luka Mali Ston, about a mile south-eastward, the south-western side of the channel is fringed by a reef as much as half a cable wide in places.

South-eastward of the shallow portion just described, the channel widens and the depths in it increase before it terminates at the head of 15 Uvala Kuta. A group of three islands are situated on a bank in the middle of this part of the channel.

Uvala Kuta affords shelter to small vessels from all winds, in depths of from 3½ to 5 fathoms (6^m4 to 9^m1), mud, good holding ground.

Lights.—Buoyage.—A light is exhibited, at an elevation of 30 feet 20 (9^m1), from an iron column, 25 feet (7^m6) in height, on Rt Čeljen (*Lat.* 42° 52' N., *Long.* 17° 41' E.).

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column on a concrete base, 21 feet (6^m4) in height, on Rt Mirna.

A light is exhibited, at an elevation of 10 feet (3^m0), from a conical 25 masonry beacon, 12 feet (3^m7) in height, standing on Pličina Greda.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 17 feet (5^m2) in height, on Rt Mali Voz.

The channel between Pličina Greda and the coast south-westward is marked by four buoys, two on each side of the channel. 30

Directions.—After passing the light-column on Rt Čeljen, a vessel should steer towards the light-column on Rt Mirna, until the light-beacon on Pličina Greda is in line with the light-column on Rt Mali Voz, bearing 124°, whence local knowledge is necessary for passing through the shallow portion of the channel. After passing through the 35 shallow portion, she should steer east-south-eastward until near the shore on the north-eastern side of the channel and then south-south-eastward.

Mali Ston.—This small town, surrounded by old walls, lies at the head of Luka Mali Ston, on the south-western side of Kanal Malog 40 Stona, about 2 miles from its head. It has a small boat harbour, and is only visited by vessels that can pass through the narrow channel previously described. The ruin of Fort Bartolomija, 817 feet (249^m0) high, situated half a mile south-westward of the town is conspicuous.

Charts 2713, 1440, 2158a.

CHAPTER VI

COAST OF YUGOSLAVIA FROM ABREAST OTOK HVAR TO RT PLOČA,
AND ADJACENT ISLANDS WITH THE CHANNELS BETWEEN.

Charts 2713, 2712.

COAST.—From Uvala Zaoštrog page 247, to Rt Ploča (*Lat. 43° 30' N., Long. 15° 58' E.*), about 62 miles west-north-westward, the coast presents a diverse aspect of fertile, cultivated country and dry, barren land, backed by high bare-topped mountains.

Several islands lie off this stretch of coast. Fishing is carried on in the channels between the islands.

Chart 2712.

HVARSKI KANAL.—**General description.**—Hvarski (Hvar) kanal is the passage between Otok Hvar, page 243, and Otok Brač, northward, and is about $1\frac{1}{2}$ miles wide in its narrowest part. There are no sunken dangers, except the spit extending $1\frac{1}{2}$ cables from Zlatni rat, on the northern side of the channel, about 10 miles east-south-eastward of the western extremity of Otok Brač; the bottom is sand and mud. At its eastern end, the channel leads south-eastward into Neretvanski kanal and north-westward into the eastern part of Brački kanal.

Hvarski kanal is seldom used except by vessels bound to the harbour of Makarska, situated on the mainland at the eastern end of the channel. In sailing vessels, the northern shore should be kept aboard so as to be able, if overtaken by a Bora, to bear up for Starigradski zaliv, on the north-western side of Otok Hvar, or the anchorage off the village of Bol, situated near the middle of the southern coast of Otok Brač.

Current.—Under normal conditions the current sets eastward and westward, and is influenced at the most contracted part of the channel by north-westerly and south-easterly winds, also by the waters of Reka Neretva. In strong south-easterly winds, which cause a continuous west-going current, an east-going counter stream sets along the northern side of Otok Hvar between Rt Pelegrin and Rt Kabal, which at times may attain a rate of 2 knots, and causes a slack on the coast eastward as far as Vrboska.

Telegraph cables.—Two submarine cables, indicated on the chart, cross Hvarski kanal; the western from about half a mile north-westward of Draga Stinja to Zlatni rat, and the eastern, from the cove

Charts 1440, 2158a.

Chart 2712.

close eastward of Draga Stinja to Bol. The northern end of the latter cable is marked by a tower near the south-eastern end of the sea wall at Bol.

A submarine cable, indicated on the chart, crosses the channel from a point about 3 miles westward of the eastern end of Otok Hvar to Rt Igrane, on the mainland, about $3\frac{1}{2}$ miles north-north-eastward.

Vessels must avoid anchoring in the vicinity of these cables.

Channel.—Hvarski kanal is entered from westward between Rt Pelegrin, page 240, and Rt Ražanj, at the western end of Otok Brač, about $7\frac{1}{2}$ miles north-north-eastward.

From Rt Pelegrin, the southern side of the channel trends for a distance of 10 miles eastward to the town of Starigrad, at the head of Starigradski zaliv; it is bold throughout and is indented by numerous small coves, the land immediately within rising to elevations of from about 350 to 1,300 feet (106^m7 to 396^m2).

There is good anchorage under the north-eastern side of Uvala Duga, situated 2 miles eastward of Rt Pelegrin; the bottom is sandy and there are rocks suitable for hawsers ashore. The islet on the western side of the entrance to this cove is covered with low shrubs. There is also good anchorage in the eastern arm of Uvala Pribinja (Vira), three-quarters of a mile farther eastward.

Uvala Stiniva (Stinjiva) lies $4\frac{1}{2}$ miles eastward of Rt Pelegrin; on the western side of this cove, near its head, there is a breakwater with depths of about 12 feet (3^m7) alongside, to which small vessels, with local knowledge, can secure.

Rt Kabal (*Lat.* $43^\circ 14' N.$, *Long.* $16^\circ 31' E.$), well wooded and 404 feet (123^m1) high, situated about 4 miles north-westward of Starigrad, is the north-eastern entrance point of Starigradski zaliv, page 260, and the western termination of a peninsula with a bold indented coast, projecting from the northern coast of Otok Hvar.

On the northern side of the channel, from Rt Ražanj, the coast trends about 6 miles east-south-eastward and then the same distance eastward to Bol. The western part of this stretch of coast is indented with a number of coves of which Uvala Osibova (St. Josip), Uvala Lučica, Uvala Grška Velika, and Uvala Smrka, situated about $1\frac{1}{2}$, 2, $3\frac{1}{2}$ and $4\frac{1}{2}$ miles, respectively, east-south-eastward of Rt Ražanj, are the only ones worthy of mention; these coves can only accommodate small craft. A spit, with a depth of $2\frac{1}{2}$ fathoms (5^m0) over it, extends about $1\frac{1}{2}$ cables south-eastward of the western entrance point of Uvala Lučica. In these coves vessels generally secure to the shore after anchoring.

Bol (*Lat.* $43^\circ 16' N.$, *Long.* $16^\circ 39' E.$) is the principal village of Otok Brač; it extends nearly three-quarters of a mile along the coast. In 1931, Bol contained 2,480 inhabitants. Near the centre of the village, there is a cove and mole where small craft can find shelter. Anchorage for larger vessels is described on page 263. Bol lies at the foot of Vidova Gora (Sulvid), 2,552 feet (777^m9) high, and the summit of Otok Brač, about 2 miles north-westward; this mountain is a good distant mark. Sveta Nedelja steeple, eastward of the village, is conspicuous.

Zlatni rat, situated about a mile westward of Bol, is a low, yellow shingle bank from which, as well as from the coast for the distance of about three-quarters of a mile eastward of it, foul ground extends

Charts 1440, 2158a.

Chart 2712.

about 2 cables offshore ; a chapel stands a short distance north-eastward of Zlatni rat.

On the southern side of Hvarski kanal, Uvala Glavna (Vlaška) luka is entered between a point, about half a mile north-eastward of Rt Kabal, and a point, which is foul for a short distance offshore, about three-quarters of a mile farther east-north-eastward ; the coast between the eastern entrance point of Uvala Glavna luka and Rt Glavica, about $7\frac{1}{2}$ miles south-eastward, is indented with a number of small coves, the entrances to which are exposed to the Bora. The most suitable for small vessels is Uvala Žukova, situated about $2\frac{1}{4}$ miles south-eastward of Uvala Glavna luka. Small vessels, with local knowledge, can find shelter, except in north-westerly winds, in Uvala Glavna luka ; vessels anchor in these coves and also secure to the shore.

15. *Chart 1612, plan of Vrboska and Jelsa harbours.*

Otočić Zečevo, 92 feet (28^m0) high and covered with bushes and trees, lies northward of Rt Glavica and 3 cables offshore. Small vessels can anchor off its southern side during a Bora, but it affords no shelter from the Scirocco.

20 Rt Glavica, bare and yellowish in colour, and 85 feet (25^m9) high, is the termination of a peninsula. The old tower on Glavica, a hill, 249 feet (75^m9) high, about a mile west-north-westward of the point, is conspicuous. There is a white cross on the summit of this hill.

Luka Vrboska and Luka Jelsa, page 261, lie within the bay which is entered between Rt Glavica and a point about three-quarters of a mile south-south-eastward. The entrance of Luka Jelsa is about a quarter of a mile wide. The eastern entrance point is bluff and covered with trees, and has a large monastery on it ; the latter and the steeple of the church in the village of Jelsa are conspicuous.

30 *Chart 2712.*

Om, a mountain with a flat summit, 1,978 feet (602^m9) high, is situated about $2\frac{1}{4}$ miles south-westward of the eastern entrance point of Luka Jelsa (*Lat.* 43° 10' N., *Long.* 16° 42' E.).

On the northern side of Hvarski kanal, from Bol, the coast trends about 9 miles eastward and one mile north-eastward to Rt Sumartin. The harbour of Sumartin, page 262, situated at the south-eastern end of Otok Brač, and in the north-eastern part of a bay close westward of Rt Sumartin, affords protection from the Bora, the force of which is considered to be broken to some extent by the woods on this part of the island. Rt Sveti Roko, on which there is a church, lying half a mile north-eastward of Rt Sumartin, indicates the position of this harbour.

Between Rt Sveti Roko and Rt Rašćatna, the eastern extremity of Otok Brač, about 2 miles north-eastward, the coast is indented.

45 Brački kanal is entered, from south-eastward, between Rt Rašćatna and Rt Sveti Petar, on the mainland, about 5 miles east-south-eastward.

On the southern side of Hvarski kanal, from the eastern entrance point of Luka Jelsa, the coast trends almost straight for about 22 miles eastward to Rt Sućuraj. There is no place of shelter, with the exception of a small cove here and there, along this stretch of coast and the depths are considerable close inshore. Pličina Bristova, with a least depth of $4\frac{1}{2}$ fathoms (8^m2), rock, over it, lies about 8 miles westward of Rt Sućuraj and about 6 cables northward of Rt Bristova, the eastern entrance point of Uvala Bristova.

Charts 1440, 2158a.

Chart 2712.

Among the numerous coves along this coast, Uvala Pokrivenik, Uvala Bristova and Mlaska cove may be mentioned.

Uvala Pokrivenik, about 8 miles eastward of Luka Jelsa, is exposed to the Bora, and not used in winter; the bottom of this cove is rocky in places and the holding ground untrustworthy. The western entrance point is foul and should be given a berth of at least $1\frac{1}{2}$ cables. In summer, small vessels can anchor in depths of from 14 to 16 fathoms (25^m6 to 29^m3), and coasters find shelter against the Bora in the south-eastern part of the cove, where there are boulders to which they can secure.

Uvala Bristova, situated about 6 miles farther eastward, is visited by local steamers. There is a short quay on the south-eastern side of this cove to which vessels, drawing up to 10 feet (3^m0), can secure in fine weather.

Mlaska cove, situated close south-westward of Rt Mačeni Bad, about $2\frac{1}{4}$ miles west-north-westward of Rt Sućuraj, affords shelter to coasters in a Scirocco and partial shelter in a Bora.

Charts 2713, 2712.

At the eastern end of Hvarski kanal, the mainland coast, between the north-western entrance point of Uvala Zaoštrog, page 247, and Rt Sveti Petar, about 15 miles north-westward, is backed by high land presenting a few bare peaks; Susvid, a conical mountain, 3,790 feet (1115^m2) high, standing about 4 miles northward of Rt Sućuraj, is the highest and most remarkable of these peaks. There are a few scattered villages and the land is cultivated, but there is no harbour or good anchorage on this part of the coast.

Chart 2713.

Small craft occasionally seek shelter from the Bora, in a depth of about 9 fathoms (16^m5), at a distance of a cable offshore, and when meeting contrary winds between the eastern part of Otok Hvar and the mainland, resort to Uvala Zaoštrog or to Uvala Drvenik, about $1\frac{1}{4}$ miles north-westward.

Uvala Zaoštrog lies under the western slopes of Witer, a mountain, 2,530 feet (771^m1) high, and may be identified by several houses and a convent with a high steeple, on the shore at the north-western end of the bay. The northern part of the bay is shallow. For anchorage, see page 263.

The village of Zaoštrog lies about a mile north-eastward of the bay on the slope of Mount Drinak, 3,008 feet (916^m8) high (*Lat.* $43^\circ 09' N.$, *Long.* $17^\circ 19' E.$).

The village of Duba is situated on the eastern side of Delik cove, about a mile north-westward of Uvala Zaoštrog, and there are several houses and a chapel on the shores of Uvala Drvenik, situated close north-westward of Delik cove. For anchorage in these coves, see page 263.

There is a small artificial boat harbour at Živogošće (St. Luka), situated about a mile south-eastward of Rt Igrane.

Chart 2712.

Uvala Igrane is on the eastern side of Rt Igrane, which projects south-south-eastward, about 5 miles north-westward of Uvala Drvenik. Sveti Križ convent, on the coast, about a mile south-eastward of Rt Igrane; the high white tower of Na Kraj church, about 3 cables north-north-westward of the point; and, from eastward, the village of

Chart 2712.

Igrane, are conspicuous. A short breakwater, with a depth of 7 feet (2^m1) on its northern side, extends from the western side of Uvala Igrane and gives protection to small craft from all winds. For anchorage, see page 263.

Off Podgora, a village, which contained 2,000 inhabitants in 1931, situated about 4 miles north-westward of Rt Ingrane and half a mile inland, there are two harbours; the western harbour is protected by a short mole extending offshore in an easterly direction, and the eastern, 10 by a mole, on which there is a light-column, extending offshore in a southerly direction. For anchorage, see page 263.

The harbour of Makarska, about 4 miles north-westward of Podgora light is described on page 262.

Lights.—The light on Rt Pelegrin is described on page 241.

15 A light is exhibited, at an elevation of 56 feet (17^m1), from a white octagonal tower and dwelling, 48 feet (14^m6) in height, on Rt Ražanj (Lat. 43° 19' N., Long. 16° 24' E.). See view.



Rt Ražanj lighthouse.

A light is exhibited, at an elevation of 52 feet (15^m8), from a white iron framework tower, on Rt Kabal.

A light is exhibited, at an elevation of 24 feet (7^m3), from a white square stone tower, 23 feet (7^m0) in height, on the molehead at Bol.

Chart 1612, plan of Vrboska and Jelsa harbours.

A light is exhibited, at an elevation of 36 feet (11^m0), from a red, 30 circular, iron tower on a square masonry base, 23 feet (7^m0) in height on the eastern extremity of Otočić Zečevo.

Chart 2712.

A light is exhibited, at an elevation of 24 feet (7^m3), from a stone tower and a dwelling, 19 feet (5^m8) in height, 35 situated on Rt Sumartin. See view.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 12 feet (3^m7) in height, on the eastern molehead at Podgora.

The light on Rt Sućuraj is described on 40 page 247.

Charts 1612, plan of Stari Grad bay, 2712.

Starigradski zaliv.—**Lights.**—Starigradski (Stari grad) zaliv is situated near the western end of the southern side of Hvarski kanal and is entered between Rt Kabal, 45 page 257, and the eastern entrance point of Uvala Lučišće, about 1½ miles south-westward; the bay is open north-westward. The bottom consists of mud and sand. Uvala Gračišće, the entrance to which is narrow, is situated on the south-western side of the bay, about a mile eastward of the entrance. Tiha luka, the entrance to which is 50 about 3½ cables wide, lies at the head of an indentation on the north-eastern side of the bay, about 1½ miles south-eastward of Rt Kabal; banks with depths of less than 5 fathoms (9^m1) over them, about a cable wide, extend from both sides of Tiha luka in places. Uvala Zavale is situated about a mile farther south-eastward.



Rt Sumartin lighthouse.

Charts 1440, 2158a.

Charts 1612, plan of Stari Grad bay, 2712.

The town of Starigrad, which contained 2,000 inhabitants in 1931, lies at the head of the bay, on the southern side of the eastern end of a narrow, shallow inlet, of which Rt Fortin is the southern entrance point. Provisions can be obtained. There is frequent steamer communication with Split. 5

A light is exhibited, at an elevation of 25 feet (7^m6), from a white circular stone tower, 21 feet (6^m4) in height, on Rt Fortin (*Lat.* 43° 11' N., *Long.* 16° 35' E.).

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 17 feet (5^m2) in height, situated near the western end of the quay at Starigrad. 10

Anchorage.—Buoy.—Directions.—The best sheltered anchorage for small vessels, during the Bora season, is either in Tiha luka or in Uvala Zavale; in southerly winds, they can moor in Uvala Gračišće, 15 but the best place is in the harbour of Starigrad, where there are bollards on both sides, and a quay.

A white conical buoy is moored, in a depth of 1½ fathoms (2^m7), on the northern edge of a shoal, close westward of the quay at Starigrad.

The anchorage in Starigradski zaliv is in depths of about 14 fathoms (25^m6), about three-quarters of a mile westward of the town.

A vessel, entering at night, should steer for Rt Fortin light, bearing 120°, and when passing northward of that point, to enter the harbour, should remember that the light is 55 yards (50^m3) southward of the point. 25

Chart 1612, plan of Vrboska and Jelsa harbours.

Luka Vrboska.—Anchorage.—Lights.—Luka Vrboska, which is entered between Rt Glavica, page 258, and a point about half a mile southward, is protected from northerly winds by the peninsula terminating in the former point. Vessels can anchor, in depths of from 12 to 14 fathoms (21^m9 to 25^m6), mud, at a distance of 4½ cables westward of Rt Glavica. Small vessels can go farther in, and shelter from Bora gales by securing to the north-eastern shore. Small vessels can secure to the quay on the southern side of the harbour north-westward of the light-column, where there are depths of about 9 feet (2^m7). 35

The village of Vrboska, in which there were 750 inhabitants, in 1931, lies at the head of a narrow inlet, about 1½ miles west-north-westward of Rt Glavica.

A strong Scirocco causes a rise of water, which enters the narrow part of the harbour with great velocity, and may reach a height of 40 6½ feet (2^m0), sometimes flooding the village and damaging the vessels moored there.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column on a concrete hut, 16 feet (4^m9) in height, on Rt Sveti Križ, situated about half a mile westward of Rt Glavica. 45

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 13 feet (4^m0) in height, on the quay at Vrboska.

Luka Jelsa.—Anchorage.—Lights.—Luka Jelsa, the entrance to which is described on page 258, is open north-eastward. The village of Jelsa, in which there were 1,500 inhabitants, in 1931, lies at the head of the harbour where the inlet turns westward and is protected by two moles, one projecting from the northern and one from the southern side. The harbour westward of the moles is walled and there are two quays to which small vessels can secure, that on the southern 50

Chart 1612, plan of Vrboska and Jelsa harbours.

side having a depth of about 10 feet (3^m0) alongside and that on the northern side, about 8 feet (2^m4).

Small vessels can anchor, in a depth of about 6 fathoms (11^m0), near the middle of the inlet, outside the moles, but this position is not suitable in winter.

A light is exhibited, at an elevation of 22 feet (6^m7), from a white octagonal tower, 24 feet (7^m3) in height, on the head of the northern mole at Jelsa.

10 A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 15 feet (4^m6) in height, on the eastern corner of the southern quay at Jelsa.

Chart 2712.

Sumartin harbour.—Anchorages.—Light.—The harbour of Sumartin, mentioned on page 258, is sheltered south-westward by a mole. Vessels of moderate draught can anchor in the middle of the bay in which the harbour is situated, in depths of from 16 to 20 fathoms (29^m3 to 36^m6), with a hawser to the northern shore, in a Bora; small vessels can moor in the harbour, off the village, which contained about 20 700 inhabitants, in 1931; here vessels are sheltered from the Scirocco, which causes a heavy sea.

Small vessels, drawing up to 11 feet (3^m4), can lie alongside the inner side of the mole. The depths alongside the other moles are shoal. On the south-western side of the cove in the north-western part of the bay, there is a mole with a depth of 10 feet (3^m0) on its north-western side.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 17 feet (5^m2) in height, situated on the molehead at Sumartin (Lat. 43° 17' N., Long. 16° 52' E.).

30 *Chart 1612, plan of Port Makarska.*

Makarska harbour.—Anchorages.—Light.—The harbour of Makarska lies eastward of the rocky peninsula of which Rt Sveti Petar, page 258, is the north-western termination; the bottom consists of mud. The harbour is used by vessels of moderate size; coasters 36 anchor at the head and make fast to piles on the beach or lie alongside the quay. It is partly sheltered from south-westward by the south-eastern end of the peninsula just mentioned, on the summit of which is Sveti Petar chapel, but is subject to heavy Bora squalls from the high land north-eastward. A mole for the local steamer, with a depth of 40 13 feet (4^m0) at its head, extends from the quay on the eastern side of the harbour, and there is a smaller mole in shoal water on the northern side. There is a mooring buoy in the western part of the harbour.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 17 feet (5^m2) in height, situated near the head of the mole at 45 Makarska.

The town of Makarska, which contained about 2,117 inhabitants, in 1931, is situated on the north-eastern side of the harbour.

H.M.S. *Protector*, in 1938, anchored in good holding ground, in a depth of 22 fathoms (40^m2), with Rt Sveti Petar bearing 341°, distant 50 4½ cables.

Donjaluka bay, on the northern side of the peninsula, is sheltered from southerly winds, but is not used by large vessels in a bora, which is felt very strongly here. Large vessels can anchor in the middle of this bay, north-eastward of Rt Sveti Petar, in depths of about 12 fathoms

Charts 1440, 2158a.

Chart 1612, plan of Port Makarska.

(21^m9), sand; small vessels can moor near the eastern shore where there are bollards.

Chart 2712.

Other anchorages in Hvarski kanal.—Off Bol, page 257, large vessels can anchor opposite the cove, in depths of from 9 to 11 fathoms (16^m5 to 20^m1), sand, abreast Sveti Nikola church, which stands on a hill at the eastern end of the village. 5

Chart 2713.

In Uvala Zaostrog, page 259, large vessels can anchor south-south-westward of the convent, in a depth of 14 fathoms (25^m6), mud, or as convenient; the holding ground is good. Small vessels can anchor in the middle of the bay and lay out a cable to the shore, besides taking extra security seaward against southerly winds. There is a small mole, to which vessels drawing up to 11 feet (3^m4) can secure. 10

Uvala Drvenik, page 259, is a good anchorage for small vessels in a Bora; they can anchor in the eastern part of the cove with a hawser north-eastward, or in Delik cove, close off the houses at Duba. The holding ground of sand and mud is good in both coves, and there are boulders suitable for moorings. 15

Charts 2713, 2712.

Uvala Igrane, page 259, can be used by small vessels as an anchorage in a Bora. Vessels can anchor eastward of Rt Igrane (*Lat.* 43° 12' N., *Long.* 17° 09' E.), in a depth of about 9 fathoms (16^m5), sand and mud, good holding ground, and lay out a hawser to the shore. 20

Chart 2712.

At Podgora, page 260, there is anchorage, opposite the town, only during a Bora or in fine weather. Small craft can moor inside the western mole, protected from all winds and sea. Vessels drawing up to 11 feet (3^m4) can secure alongside the eastern mole but are protected 30 only from the Bora and northerly winds.

OTOK BRAČ.—This island is separated from the mainland, eastward and north-eastward, by Brački kanal and from Otok Šolta (Šulet) by Splitska Vrata, page 269. Its southern side is very mountainous, the slope towards the northern coast being gradual. Vidova Gora, the 35 summit, page 257, stands about a mile inland from the middle of the southern coast. The mountains are wooded; their lower grounds are cultivated. There are a number of villages on Otok Brač.

BRAČKI KANAL.—General description.—The south-eastern entrance of Brački (Brač) kanal is described on page 258; at its 40 western end, it joins Splitski (Split) kanal. The channel is exposed to sudden and violent Bora gales. The bottom almost everywhere consists of mud; along the coast of Otok Brač, and occasionally near the mainland, it is a mixture of mud and sand.

Under normal conditions, east- and west-going tidal streams are 45 noticeable; under the influence of continuous south-easterly winds, and when Cetina and Neretva rivers are swollen, a continuous west-going current is caused, which may reach a rate of 2½ knots in the eastern and narrower part of the channel and of 1½ knots in the western part. 50

Telegraph cables.—Three submarine cables, indicated on the chart, are laid across Brački kanal from Otok Brač to the mainland

Charts 2712, 1440, 2158a.

Chart 2712.

northward. Vessels must avoid anchoring in the vicinity of the cables.

Channel.—From Rt Sveti Petar, page 258, the north-eastern side of Brački kanal trends about 8 miles north-westward to Uvala Vrlje and then $7\frac{1}{2}$ miles westward to Velika Luka cove.

Biokovo, a mountain, 5,780 feet (1761^m7) high, standing about $3\frac{1}{2}$ miles north-eastward of Rt Sveti Petar, is the highest and most remarkable in the neighbourhood, and, like others north-westward, its upper part is whitish and bare. When it is enveloped in fog, which rises in a scattered form, a strong northerly wind may be expected. In winter it is frequently covered in snow.

This stretch of coast is backed close inland by high rocky mountains, except between Promajina cove and Uvala Baškavoda, situated 3 and $4\frac{1}{2}$ miles, respectively, north-westward of Rt Sveti Petar, where the mountains recede from the coast. The land rises in a gentle slope from the coast to the base of the mountains and is generally cultivated.

Soline cove is situated about a mile north-westward of Uvala Baškavoda, and Stomorica (Crkavlje) cove, about a mile farther north-westward and a short distance south-eastward of the village of Donja Brela.

At Uvala Vrlje, there is an abrupt depression, southward of which the mountains rise to greater elevations than westward of it. The coast between Rt Sveti Petar and Uvala Vrlje has a barren desolate appearance, as has the neighbourhood of the latter.

There are several villages, of which Rogoznica, on a hill 2 miles south-eastward of Borak, page 265, is the most conspicuous.

Uvala Vrlje is difficult of approach by sailing craft, owing to strong eddies caused by subaqueous springs; it is not suitable as an anchorage; the depths near it are considerable, both at the entrance and close offshore. The Bora blows with violence through the depression previously mentioned.

The small harbour of Kutleša, where there is a mole in shallow water, is situated close westward of a point of the same name, about $3\frac{1}{2}$ miles westward of Uvala Vrlje.

Velika Luka cove lies about 4 miles westward of Kutleša point (*Lat.* $43^{\circ} 24' N.$, *Long.* $16^{\circ} 48' E.$).

For anchorages off this part of the coast, *see* page 268.

On the south-western side of Brački kanal, Rt Rašcatna, page 258, is rugged, and the land westward of it rises to a considerable height; between Rt Rašcatna and Pučišće luka, about $7\frac{1}{2}$ miles west-north-westward, the land gradually alters from the completely barren region of that cape to cultivation. A bay, in which there are several coves, is entered between Rt Sveti Ante, about $3\frac{1}{2}$ miles west-north-westward of Rt Rašcatna, and Luke point, about half a mile farther west-north-westward; Povelje cove is situated in the south-eastern part of this bay. A bank extends a short distance from Rt Sveti Ante; the point has a lighthouse on it and it should be given a berth of over a cable. For anchorage, *see* page 268.

Pučišće luka, a narrow inlet with two short arms at its head, is entered close eastward of Rt Sveti Nikola, situated about $1\frac{1}{2}$ miles west-north-westward of Rt Sveti Ante. There is a quarry on the eastern entrance point, and this, together with the lighthouse on Rt Sveti Nikola, serve to distinguish the entrance. The village of Pučišće, which contained 1,815 inhabitants, in 1931, is situated round the

Charts 1440, 2158a.

To face page 265.



Franjevački convent.

*Povica Castle,
bearing 024°.*

O mis.

(Original dated 1910.)

Omiš.

Sv. Jure.

Chart 2712.

shores of the south-western arm, which affords good shelter for small vessels, with local knowledge. For anchorage, *see* page 268.

The harbour of Postire, about 5 miles westward of Rt Sveti Nikola, is protected by a breakwater and a short mole, between which there is a small quay; small vessels can lie along the inner side of the breakwater. The village of Postire, which, in 1931, contained 1,217 inhabitants, lies on the eastern side of the harbour.

Charts 1612, plan of Omiš road, 2712.

On the north-eastern side of Brački kanal, Mala Luka cove lies close westward of Velika Luka cove. These coves are situated at the base of Borak, a mountain with a bare, rocky peak, 2,635 feet (803^m) high, standing about a mile inland. There is a bight between the western entrance point of Mala Luka cove and Rt Dugirat, about 3 $\frac{1}{4}$ miles north-westward. Omiš road, page 267, is situated in this bight, and the mouth of Cetina river, one of the chief rivers of Yugoslavia, lies at its head. This river is navigable by boats, drawing about 3 feet (0^m9), for some distance inland; the passage over the bar, on which there is a depth of little over 3 feet (0^m9), requires local knowledge, as it is liable to change.

The town of Omiš, surrounded by trees and cultivated land, is situated on the eastern bank at the mouth of Cetina river, and at the foot of a mountain, 1,020 feet (310^m9) high, on the summit of which is Peovica castle. It contained 3,000 inhabitants, in 1931. The white buildings of the town are conspicuous.

Chart 2712.

Kozik, 4,324 feet (1318^m0) high, one of the peaks of the Mosor range, stands about 2 $\frac{1}{4}$ miles northward of Omiš. Borak, mentioned above, marks the position of the anchorage in Omiš road. *See* view facing this page.

Rt Dugirat has a bank, with depths of less than 6 feet (1^m8) over it, about 2 cables wide and steep-to, extending off the coast close north-westward of the point.

Buoy.—A conical buoy, painted red, surmounted by a cylinder, marks the south-western edge of the bank extending off Rt Dugirat (Lat. 43° 27' N., Long. 16° 39' E.).

Channel.—**Dangers.**—On the southern side of Brački kanal, Uvala Spliska, which is narrow, is situated about a mile westward of Postire. The eastern entrance point is low and the cemetery on it serves as a mark. The village of Spliska lies at the head of the harbour.

The harbour of Supetar, about 2 $\frac{1}{4}$ miles westward of Spliska, is the chief of the small harbours on the northern coast of Otok Brač, and is protected northward by a breakwater and westward by a short mole. Its position can be identified by a small church near its western entrance point, and by the village of Supetar, which is on a hill close southward of the harbour. The Bora is felt strongly here and the Scirocco causes a heavy sea outside the harbour. For anchorage, *see* page 268.

A rocky patch, with a depth of 2 $\frac{1}{4}$ fathoms (5^m0) over it, and steep-to, lies half a mile offshore northward of the harbour of Supetar. Supetar church and lighthouse in line lead westward of this shoal.

The village of Supetar (Lat. 43° 23' N., Long. 16° 33' E.) contained 1,500 inhabitants, in 1931.

The north-eastern side of Brački kanal, between Rt Dugirat and

Charts 1440, 2158a.

Chart 2712.

the western entrance point of Luka Stobreč, about $6\frac{1}{2}$ miles west-north-westward, is accessible throughout. The land for a short distance within the coast is cultivated, with numerous dwellings. The
 5 land rises abruptly from the inner end of the cultivated ground to rocky mountains of whitish aspect, from 1,443 to 1,948 feet (439^m8 to 593^m7) high, which afford protection from northerly winds. Several villages lie under the crest of the mountains.

Close westward of Rt Dugirat, there is a conspicuous white factory.
 10 A quay, from the south-eastern angle of which extends an embankment giving protection from south-easterly winds, has been constructed here; there is a least depth of 20 feet (6^m1) alongside the quay. There are some mooring buoys westward of the quay.

Uvala Krilo, where there are two moles, is situated close eastward of
 15 a point of the same name, about $2\frac{1}{2}$ miles west-north-westward of Rt Dugirat. Vessels can secure to either the eastern or western side of the eastern mole, where there are depths of about 14 feet (4^m3), or to the western side of the western mole, where there are depths of from 2 to 10 feet (0^m6 to 3^m0). Rt Mutogras, where there is a conspicuous
 20 conical hill, 364 feet (111^m0) high, lies about a mile farther westward. There is a jetty, with a depth of 7 feet (2^m1) at north-west-its head, at Sveti Martin, situated about half a mile north-westward of Rt Mutogras (*Lat.* $43^\circ 28' N.$, *Long.* $16^\circ 35' E.$).

The village of Stobreč, which had a population of 470, in 1931, stands
 25 on a point forming the western side of Luka Stobreč, and is visible for some distance; the entrance to the harbour is about 3 cables wide and the entrance points are foul for a short distance offshore. A shallow bank borders the shores of the harbour, being widest on the northern and western sides. The harbour is open southward and is
 30 not suitable as an anchorage. There are some mooring buoys in the harbour and two moles, alongside the north-eastern of which vessels can berth. For anchorage, *see* page 268.

The Zrnovnica river flows into the head of Luka Stobreč.

Between the village of Stobreč and Splitska luka, 4 miles westward,
 35 the coast is inaccessible and bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 2 cables wide in places; the eastern part is backed by high land which slopes steeply to the sea. A detached, rocky ridge, with depths of $4\frac{1}{2}$ fathoms (8^m7) over its northern end, and $7\frac{1}{2}$ fathoms (14^m1) over its southern end, lies from
 40 three-quarters of a mile to 2 miles offshore, about midway between the two harbours; a detached bank, with a depth of $7\frac{1}{2}$ fathoms (14^m1) over it, lies about $2\frac{1}{2}$ miles south-westward of Stobreč, about a mile south-eastward of the southern end of this ridge.

On the southern side of Brački kanal, Sutivanska (Sutivan) luka,
 45 situated about $3\frac{1}{2}$ miles westward of Supetar and 2 miles eastward of Rt Sveti Juraj, the north-western extremity of Otok Brač, is protected from the Bora and Scirocco by a mole and has depths of from 10 to 13 feet (3^m0 to 4^m0) in it. Small vessels, drawing 7 feet (2^m1), can secure to the inner side of the mole at its western end. The Bora
 50 blows very strongly here. The village of Sutivan is situated round the shores of the harbour, and contained 960 inhabitants, in 1931; the church tower in the village is conspicuous. For anchorage, *see* page 269.

Brački kanal is connected with Splitski kanal, page 281, at its western end, between Rt Sveti Juraj and Splitska luka.

Charts 1440, 2158a.

Chart 2712.

Lights.—A light is exhibited, at an elevation of 22 feet (6^m7), from an iron pyramidal structure, 16 feet (4^m9) in height, on the mole-head at Baškavoda (*Lat.* 43° 21' N., *Long.* 16° 57' E.).

A light is exhibited, at an elevation of 25 feet (7^m6), from a white stone tower, 23 feet (7^m0) in height on Rt Sveti Ante, the eastern entrance point of Povelje cove. *See view.*

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, on the head of the mole at Kutleša.

A light is exhibited, at an elevation of 66 feet (20^m1), from an hexagonal tower on a dwelling, 38 feet (11^m6) in height, on Rt Sveti 15 Nikola, the western entrance point of Pučišće luka.,

Chart 1612, plan of Omiš road.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red iron structure, 15 feet (4^m6) in height, in the wall of Franjevački convent at Omiš.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 17 feet (5^m2) in height, situated on the angle of the mole at Omiš.

Chart 2712.

A light is exhibited, at an elevation of 23 feet (7^m0), from a masonry 25 tower, 20 feet (6^m1) in height, on the head of the mole at Postire.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column, 19 feet (5^m8) in height, on the eastern entrance point of Uvala Spliska.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron 30 column on the western molehead at Uvala Krilo.

A light is exhibited, at an elevation of 24 feet (7^m3), from a red iron structure on a hut, 20 feet (6^m1) in height, situated on the head of the breakwater at Supetar.

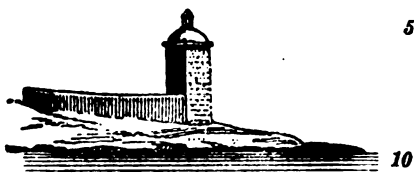
A light is exhibited, at an elevation of 21 feet (6^m4), from an iron 35 column, 17 feet (5^m2) in height, on the molehead at Sutivan.

Chart 1612, plan of Omiš road.

Omiš road.—**Anchorage.**—The north-western side of the bight in which Omiš road, page 265, is situated, is bordered by a bank, which is steep-to, extending as much as 4 cables offshore; this bank is 40 formed by the deposit from Cetina river and has depths of only 3 feet (0^m9) over its outer edge in places; it extends westward as far as Rt Dugirat, where it is narrow. The edge of the bank near the harbour of Omiš is marked by piles which are often washed away and cannot be depended on. At night, this bank is covered by the *white* sector of the 45 light on Franjevački convent, bearing more than 071°.

The shallow harbour of Omiš is formed by a small mole, the outer arm of which extends south-eastward at right angles to the inner; small vessels can lie alongside this mole. There are depths of 11 feet (3^m4) along the south-western side, and depths of 14 feet (4^m3) along 50 the north-eastern side of the outer arm of the mole.

About 9 cables south-south-eastward of Franjevački convent, off the village of Ravnice, there is a stone pier alongside which vessels can lie; there are depths of about 17 feet (5^m2) alongside the pier, increas-



Rt Sveti Ante light-tower.

Chart 1612, plan of Omiš road.

ing to 23 feet (7^m0) a short distance off it. There are several mooring buoys between this pier and the harbour.

There is anchorage, in a depth of about 14 fathoms (25^m6), mud, off 5 Franjevački convent, which stands near the coast, about 4 cables south-eastward of the town; vessels of shallow draught can moor near the coast, to which they secure against the Bora, which does not blow so violently here as off other parts of the coast.

Chart 2712.

10 **Other anchorages in Brački kanal.**—Small vessels, with local knowledge, can anchor for shelter from the Bora, in Uvala Baškavoda and in Soline cove, close to the shore, to which they can secure; also in Stomorica cove. There is a depth of about 10 feet (3^m0) alongside the mole at Baškavoda, and a mooring buoy north-westward of the 15 mole.

Small vessels, unable to pass Uvala Vrulje, can find anchorage in Stomorica cove, south-eastward, or in the harbour of Kutleša, westward. There is a depth of 7 feet (2^m1) on the inner side of the mole at Kutleša.

20 Small vessels, on the setting in of the Bora, can moor close under the land between the harbour of Kutleša and Velika Luka cove; otherwise there is no safe anchorage between Uvala Vrulje and the vicinity of Borak (*Lat. 43° 26' N., Long. 16° 44' E.*).

In Povlje cove, page 264, there is anchorage for small vessels well- 25 sheltered from eastward. Vessels of moderate size can anchor in the outer part of the cove, southward of Rt Sveti Ante. At the village of Povlje, situated near the head of the cove, and which contained 730 inhabitants, in 1931, there is a short quay in shallow water and many mooring bollards; vessels drawing up to 8 feet (2^m4) can secure to the 30 head of a jetty southward of the quay. The church tower is conspicuous.

The western part of the bay between Rt Sveti Ante and Luke point, page 264, is exposed to easterly winds, and, in a Bora, is only suitable for small vessels, which anchor in the inner part, in a depth of 35 8 fathoms (14^m6), mud, with a hawser to the northern shore.

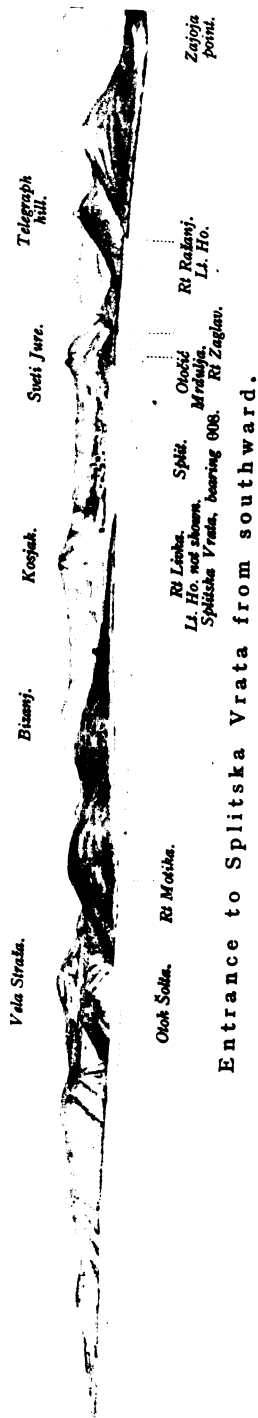
Moderate sized vessels, with local knowledge, can anchor in the entrance to the south-western arm of Pučišće luka, page 264, but must have strong shore-fasts. The bottom is sand and weed. The Bora blows across here from Uvala Vrulje, on the mainland, with great 40 strength and is deflected into the south-eastern arm of the harbour, which is therefore not used as an anchorage.

Small vessels can find anchorage, sheltered from all winds, in the inner part of Uvala Spliska, page 265, in depths of from 10 to 13 feet (3^m0 to 4^m0); there are depths of about 13 feet (4^m0) alongside a small 45 quay on the eastern side. The Bora, when strong, causes a heavy sea in the outer part of this harbour.

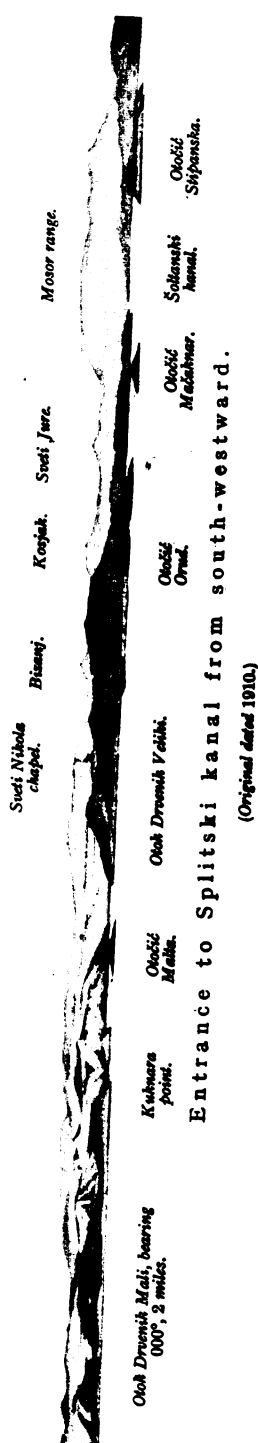
Large vessels can anchor, in the fine season, northward of the harbour of Supetar, page 265, in depths of about 14 fathoms (25^m6), sand; when approaching this anchorage the 2½-patch (5^m0), previously mentioned, 50 situated half a mile northward of the entrance, must be avoided. Small vessels, drawing up to 8 feet (2^m4), can secure alongside the outer half of the breakwater.

On the northern side of the channel, sailing vessels, on a Bora setting in, can anchor under the coast between Rt Dugirat and Luka Stobreč.

Charts 1440, 2158a.



(Original dated 1910.)



(Original dated 1910.)

Chart 2712.

page 266 ; they lie best in the shallow coves close under the land, but also can find good anchorage, with mud bottom and moderate depths, about half a mile offshore. In case of need small vessels can anchor off the eastern side of Luka Stobreč, with a hawser to the shore. 5

On the southern side of the channel, in the fine season, large vessels can anchor off Sutivanska luka, page 266, in depths of from 11 to 16 fathoms (20^m1 to 29^m3), mud, and moderately good holding ground.

APPROACHES TO SPLIT.—General description.—Split, an important commercial town, lies on the northern side of the eastern 10 end of Splitski (Split) kanal, which can be entered from southward and westward, by three channels. Splitska Vrata, the south-easternmost and narrowest of these channels, lies between Otok Brač and Otok Šolta (Šulet), about half a mile westward ; Šoltanski (Šulet) kanal, the middle one, lies between Otok Šolta and Otok Drvenik Veliki, about 15 2 miles north-westward ; and Drvenički (Drvenik) kanal, the north-westernmost, and about a mile wide, lies between Otok Drvenik Mali and Otok Drvenik Veliki, on its southern side, and the mainland, on its northern side. See views facing this page and page 283.

Splitska Vrata and its northern approach.—This passage, 20 which is the shortest route from southward to harbours in Splitski kanal, is entered between Rt Ražanj, page 257, and Rt Motika, the southern extremity of Otok Šolta, about a mile west-north-westward. Being only about 4 cables wide in its narrowest part, the passage is difficult to navigate in a sailing vessel with contrary winds when the 25 current is strong.

The eastern side of Splitska Vrata, between Rt Ražanj and Rt Zaglav, about a mile northward, and reaching an elevation of 262 feet (79^m9), is formed by a peninsula extending from the south-western end of Otok Brač, and is higher than the western side. Depths of less 30 than 6 fathoms (11^m0) extend about a cable westward of Rt Ražanj (*Lat.* 43° 19' N., *Long.* 16° 24' E.).

Uvala Livka lies on the south-western side of the passage, between Rt Motika and Rt Livka, about 4 cables north-eastward ; the eastern side of this bay is bordered by a narrow, shallow bank. For 35 anchorage, see page 270.

Rt Livka is the termination of a promontory extending south-eastward from Otok Šolta ; the southern and south-eastern sides of this promontory are bordered by a bank, with depths of less than 6 fathoms (11^m0) over it, about 1½ cables wide. The narrowest part of Splitska 40 Vrata is abreast the eastern side of the promontory. When passing through the passage, the eastern side is to be preferred.

Otočić Mrdulja, 30 feet (9^m1) high, the top of which is sparsely covered with scrub, lies on the eastern side of the northern approach to Splitska Vrata, about a quarter of a mile northward of Rt Zaglav. 45 When making for the passage from Splitski kanal, it is customary to pass westward of Otočić Mrdulja. See view facing this page.

The western side of Otok Brač, between Rt Zaglav (*Lat.* 43° 20' N., *Long.* 16° 24' E.) and Rt Sveti Juraj, about 3½ miles north-north-eastward, forms the eastern side of the northern approach to Splitska 50 Vrata, and the north-eastern side of Otok Šolta, from Rt Livka to Rt Pelegrin (Odgrisa), about 3 miles north-westward, forms the south-western side of that approach.

Charts 2774, 1440, 2158a.

Chart 2712.

The western side of Otok Brač is indented. Luka Milna, the best harbour in Otok Brač, is entered between Rt Zaglav and Rt Bijaka, about a mile eastward. The village of Milna, which contained 1,780 inhabitants, in 1931, is situated at the head of the harbour where there is an inlet running in a south-easterly direction. For anchorage, see below.

Uvala Bobovišće, a narrow inlet at the mouth of a valley, lies about $1\frac{1}{2}$ miles north-north-eastward of Rt Bijaka; the northern entrance point of this inlet is bluff, steep, rocky and covered with woods. The village of Marina is situated at the head of the inlet. The village of Bobovišće, with a church, lies about half a mile south-eastward of Marina, at an elevation of 350 feet (106^m7). For anchorage, see below.

Uvala Stipanska, a narrow inlet running northward, is situated about a mile south-south-eastward of Rt Sveti Juraj. For anchorage, see page 271.

Telegraph cable.—A submarine cable, indicated on the chart, is laid across the southern entrance of Splitska Vrata; the tower marking the western end of this cable is only visible within Uvala Livka. Vessels must avoid anchoring in the vicinity of the cable.

Lights.—The light on Rt Ražanj is described on page 260.

A light is exhibited, at an elevation of 36 feet (11^m0), from a circular tank on a stone hut, situated about a quarter of a mile north-eastward of the southern extremity of Rt Livka (*Lat. $43^\circ 20' N.$, Long. $16^\circ 24' E.$*).

A light is exhibited, at an elevation of 27 feet (8^m2), from a stone hut, 25 feet (7^m6) in height, on Rt Bijaka.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 13 feet (4^m0) in height, on the eastern side of the entrance to the inlet at the head of Luka Milna.

A light is exhibited, at an elevation of 34 feet (10^m4), from an iron structure on a dwelling, 26 feet (7^m9) in height, on the eastern entrance point of Uvala Stomorska, about 3 cables westward of Rt Pelegrin.

Anchorage.—When northerly winds render the entrance to Splitska Vrata impracticable, small vessels can anchor in Uvala Livka, page 269, and also in Uvala Vela Travna and Uvala Stračinska (Shračinska), situated on the southern side of Otok Šolta, about half a mile and one mile, respectively, west-north-westward of Rt Motika.

Luka Milna, mentioned above, is protected from all but northerly and north-westerly winds, and is considered an excellent anchorage, with room for several vessels. The outer anchorage is between Rt Zaglav and the entrance to the inner harbour eastward, in depths of from 14 to 19 fathoms (25^m6 to 34^m7). Small vessels can anchor in the middle of the inlet, or moor to the wharf in the inner harbour; anchorage in the entrance is prohibited.

Uvala Bobovišće, mentioned above, affords shelter at its entrance, where large vessels can anchor, in a depth of about $12\frac{1}{2}$ fathoms (22^m9), at a distance of $1\frac{1}{2}$ cables south-westward of a conspicuous quarry on the northern shore; this anchorage is exposed to westerly winds. Small vessels can anchor farther in under the land, and coasters in the inner part of the cove near the village, where they can make fast to the shore, sheltered from all winds. There are depths of 6 feet (1^m8) along the north-western end of the quay on the north-eastern side of the harbour. In the outer part of the cove, the Bora blows freshly.

Charts 1440, 2158a.

Chart 2712.

Uvala Stipanska is the northernmost anchorage in the northern approach to Splitska Vrata, and affords good shelter from the Bora. There is space for two or three small vessels, in a depth of 11 fathoms (20^m1), mud. Vessels of any size may anchor outside the inlet in northerly winds, south-south-westward of the western entrance point, but this anchorage is exposed to westerly winds.

Otok Šolta.—This island has a number of rocky, partially wooded, hills on it; Vela Straža, the summit, 777 feet (236^m8) high, stands on the north-eastern side of the island, about 2½ miles from its south-eastern end, and another hill of the same name, 682 feet (207^m9) high, stands about 3 miles from the north-western end of the island, and about three-quarters of a mile from its south-western side. The village of Gornje Selo (Gornjepolje), elevated 574 feet (175^m0) and situated about half a mile south-westward of the summit, is conspicuous from south-westward. The two most important harbours in the island are Uvala Maslinica, on the western side, and Uvala Rogač, on the north-eastern side.

The southern side of the island is rocky, steep and steep-to; there are many small coves so completely exposed seaward as to afford no shelter in southerly winds. Uvala Livka, Uvala Vela Travnica and Uvala Stražinska are mentioned on page 270. Uvala Tatinja, about 5 miles west-north-westward of Rt Motika affords anchorage for small vessels in northerly winds; its north-eastern arm is also sheltered from the Scirocco. This cove may be identified by some cottages, and by two small above-water rocks, one lying close off the western entrance point and the other close off the projection which separates the two arms.

Chart 2712, with plan of Drvenik channel.

Measured distances.—Beacons.—There are three measured distances in the vicinity of Uvala Tatinja, marked by four pairs of white pyramidal transit beacons, the positions of which are indicated on the chart; the north-western part of the track is 6,703 feet (2043^m1) long, the middle part 5,243 feet (1598^m1), and the south-eastern part 5,230 feet (1594^m1). The course of the track is indicated by a pair of leading beacons which are in line bearing about 304°; the front beacon stands on Marinča rat, near the south-western end of Otok Šolta, and the rear beacon stands on Otočić Balkun, about 8½ cables north-westward of the front beacon (*Lat.* 43° 23' N., *Long.* 16° 12' E.).

Šoltanski kanal.—General description.—Šoltanski (Šulet) kanal is entered from south-westward between Rt Gaj, the south-western extremity of Otok Šolta, and Rt Širan, the south-western extremity of Otok Drvenik Veliki, 5 miles north-westward. In this entrance there are several islets lying off the western end of Otok Šolta and two islets lying southward of the western end of Otok Drvenik Veliki.

The Bora blows through this channel with full strength; the Scirocco generally blows at right angles across the channel, but also draws into it at both ends; south-westerly winds cause a heavy sea.

The east- and west-going tidal streams, which change with the tide, are much influenced by the prevailing winds, and during a Scirocco are particularly variable; in these winds the west-going stream attains a rate of 2 knots and sometimes runs for from 12 to 18 hours, the much weaker east-going stream often runs for from 4 to 5 hours. The Scirocco also causes eddies.

Charts 2774, 1440, 2158a.

Chart 2712, with plan of Drvenik channel.

Telegraph cable.—A submarine cable, the position of which is approximately indicated on the chart, is laid through Šoltanski kanal.

Channel.—On the south-eastern side of Šoltanski kanal, strong currents are found with fresh winds running between the rocky islets lying off the western end of Otok Šolta.

Hrid Kamičić, 23 feet (7^m0) high, bare and light-coloured, with a shallow spit extending a short distance westward of it, lies about half a mile west-south-westward of Rt Gaj; this rock is covered by the red sector of Rt Sveti Nikola light between the bearings of 011° and 056°.

Otočić Balkun, 174 feet (53^m0) high and covered with brushwood, lies about 4 cables west-north-westward of Rt Gaj. This islet is surrounded by a bank, with depths of less than 6 fathoms (11^m0) over it, which extends about a cable off its south-eastern side; a similar bank extends a short distance off the coast of Otok Šolta, south-eastward of the islet.

Otočić Radula, 56 feet (17^m1) high, lies about 3 cables westward of Otočić Balkun, and has a 5-fathom (9^m1) patch about a cable off its southern side. Otočić Grmej, 52 feet (15^m8) high and surrounded by a shallow bank which is as much as a cable wide at its north-western end, lies about 1½ cables north-north-eastward of Otočić Radula.

Otočić Stipanska, the highest, largest and outermost of these islets, is 223 feet (68^m0) high and lies with its eastern extremity, about 1½ miles west-north-westward of Rt Gaj; this islet is covered with brushwood.

The western coast of Otok Šolta, between Rt Gaj and Rt Obinuš, about 1½ miles northward, is indented. Uvala Sešula is entered close northward of Rt Gaj, and Uvala Maslinica, with a village of the same name at its head, is entered between Rt Sveti Nikola, situated about half a mile northward of Rt Gaj, and a point about 2 cables farther northward. A narrow, shallow spit extends about half a mile westward and north-westward from the northern entrance point of Uvala Maslinica; on this spit there are two islets, Otočić Saskinja, the inner islet, is 16 feet (4^m9) high, and Otočić Polebrnjak (*Lat.* 43° 24' N., *Long.* 16° 12' E.), the outer islet, is 46 feet (14^m0) high. There are depths of 12 feet (3^m7) in the fairway of the passage between Saskinja and Šolta, and 7 feet (2^m1) in that between the two islets.

On the north-western side of Šoltanski kanal, the southern side of Otok Drvenik Veliki is cultivated and partly covered with olive groves, but the north-eastern part is wooded and 580 feet (176^m8) high. From westward and south-westward, the chapel of Sveti Nikola, a short distance eastward of a peak, 341 feet (103^m9) high, situated on the north-western side of the island, is conspicuous. See view facing page 269.

Otočić Orud, 95 feet (29^m0) high, with a sunken rock, over which there is a depth of 10 feet (3^m0), on the outer end of a spit extending about 1½ cables off its southern side, is situated about three-quarters of a mile south-eastward of Rt Širan and 4 cables off the southern side of Otok Drvenik Veliki; a bank, with depths of less than 4 fathoms (7^m3) over it, extends a short distance from the north-western end of Otočić Orud. Otočić Mačaknar, which is barren and 49 feet (14^m9) high, lies about 1½ cables south-eastward of Otočić Orud; about 2 cables south-south-eastward of Otočić Mačaknar, there is a detached mussel bank, with a depth of 6½ fathoms (11^m9) over it.

Charts 1440, 2158a.

Chart 2712, with plan of Drvenik channel.

Otočić Krknjaš Veliki, 39 feet (11^m9) high, with Otočić Krknjaš Mali, 36 feet (11^m0) high, close northward of it, lie on a shallow bank which extends about 4 cables south-eastward from the eastern end of Otok Drvenik Veliki.

Dangers.—A shoal, with a depth of 21 feet (6^m4) over it, lies nearly in mid-channel at the south-western end of Šoltanski kanal, about half a mile south-eastward of Otočić Mačaknar.

A rocky shoal, with a depth of 32 feet (9^m8) over it, lies at the north-eastern end of the channel, about 6 cables east-south-eastward of Otočić Krknjaš Veliki (*Lat. 43° 25' N., Long. 16° 10' E.*).

Light.—A light is exhibited, at an elevation of 34 feet (10^m4), from a stone dwelling, 24 feet (7^m3) in height, on Rt Sveti Nikola, the southern entrance point of Uvala Maslinica.

Anchorage.—Uvala Šešula, page 272, affords good shelter to small vessels against both Bora and Scirocco, but, since it is exposed to south-westerly winds and sea, and the holding ground is untrustworthy, Uvala Maslinica is to be preferred.

Small vessels can find shelter in Uvala Maslinica from all weather; the inner part of the inlet is shallow. Sveti Nikola chapel, elevated 140 feet (42^m7), over the point of the same name, is conspicuous. Vessels can anchor under the northern shore and secure to it, or between Otočić Balkun and the entrance, in a depth of about 6 fathoms (11^m0); the holding ground, sand and mud, is good. The Bora blows moderately in this anchorage. Vessels, drawing up to 10 feet (3^m0) can secure to a small quay on the northern side of the harbour.

There is anchorage, during a Bora or in westerly winds, between Otočić Krknjaš Veliki and Otok Drvenik Veliki, over a bottom of sand, good holding ground.

Directions.—A vessel proceeding through Šoltanski kanal to Splitski kanal should avoid the eastern end of Otok Drvenik Veliki, as the current, which is strong and irregular, in branching off to Drvenički kanal and Šoltanski kanal, sometimes sets on to it.

The best channel is between the 3½-fathom (6^m4) patch and Otočić Stipanska, keeping the latter aboard; after passing it, the coast of Otok Šolta should be closed to avoid being carried by the current towards Pličina Mačina, page 281.

Unless Otočić Stipanska can be clearly made out, large vessels should avoid this channel at night as it is not marked by lights. See view facing page 269.

A vessel bound for Uvala Maslinica from southward should steer for Otočić Balkun and take the passage between it and Rt Sveti Nikola. The southern side of Otočić Radula should be given a berth of more than 1½ cables in passing; the spit extending westward of Hrid Kamičić must be avoided. At night, Hrid Kamičić is avoided by keeping in the *white* sector of Rt Sveti Nikola light until abreast Otočić Balkun.

A vessel bound to this anchorage from northward, should take the passage between Otočić Stipanska and Otočić Polebrnjak, and keep along the south-western side of the latter; after passing Otočić Polebrnjak and Otočić Saskinja, she should alter course eastward.

In approaching Uvala Maslinica at night, Rt Sveti Nikola light, *showing white*, is visible through the narrow, shallow passage between Otok Šolta and Otočić Polebrnjak.

Chart 2712, plan of Drvenik channel.

Otok Drvenik Mali.—Anchorage.—This island lies with Rt Kalafati (Vanjska), its south-eastern extremity, about a mile west-north-westward of Rt Širan, page 271, the channel between the two Drvenik islands being about three-quarters of a mile wide in its narrowest part. This channel is seldom used as the current causes considerable eddies in it.

There are several hills on Otok Drvenik Mali, of which the highest is 262 feet (79^m9) high, and bare-topped, with cultivated patches below. The village of Drvenik Mali stands on a hill in the south-eastern part of the island.

Uvala Vela Rina is entered on the south-western side of the island, between Rt Kalafati and a point about a mile north-westward; the northern side of this bay is bordered by a narrow, shallow bank and its head is shallow. Temporary shelter from a Bora, may be found in this bay, in depths of from 9 to 16 fathoms (16^m5 to 29^m3), sand, and good holding ground, with Rt Kalafati in line with the summit of Otočić Orud, bearing about 122°; small vessels can anchor nearer the eastern shore and secure to it with a hawser. The anchorage should be quitted at the first sign of wind from seaward.

Chart 2712, with plan of Drvenik channel.

Approach to Drveničko kanal.—Drvenički (Drvenik) kanal is approached from westward between Rt Rat, the western extremity of Otok Drvenik Mali, and Rt Ploča (*Lat. 43° 30' N., Long. 15° 58' E.*), about 4½ miles north-westward. On the north-eastern side of the approach, the coast of the mainland between Rt Ploča and Rt Čovik, the northern entrance point of the channel, about 4 miles east-south-eastward, is indented and several islets lie off it.

Rt Ploča is composed of white rocks and, like the adjacent coast, is steep and inaccessible; a rock, almost awash, lies close off the point. The ruins of a small church stand on Rt Ploča, and Movar, a hill, 407 feet (124^m0), barren, and of whitish aspect, stands about three-quarters of a mile northward of it, on the north-western side of Uvala Stivančica, which is entered close westward of the point. The currents in the neighbourhood of Rt Ploča are strong, and onshore winds cause considerable eddies around it.

Between Rt Ploča and Debeli (Turski Bok) rt, about 1½ miles south-eastward, there is a bight with steep, rocky sides; Uvala Borovica, a narrow inlet, is entered on the northern side of this bight, and Uvala Kanica, on the north-eastern side. Otočić Melevrin, 8 feet (2^m4) high, over which waves often break in heavy seas, is situated in the entrance of this bight, about half a mile east-south-eastward of Rt Ploča. For anchorage, see page 275.

Uvala Sičenica, with steep, rocky sides, is entered between Debeli rt and Rt Oštrica, about three-quarters of a mile eastward; this bay has three arms at its head. For anchorage, see page 275.

Hrid Muljica (Muljica Mala), 3 feet (0^m9) high, bare and yellow, over which the sea sometimes breaks, lies in the approach to Uvala Sičenica, about 6 cables south-eastward of Debeli rt.

Uvala Stari Trogir, with steep, rocky sides and open south-westward, is entered between Rt Oštrica and a point, about a mile east-south-eastward. An above-water rock lies close off the western side of this bay, a short distance within the entrance. Some islets lie off the south-eastern entrance point of the bay and also in its approach.

Charts 2774, 1440, 2118a.

Chart 2712, with plan of Drvenik channel.

Otočić Arkandel, 259 feet (78^m9) high, and covered with scrub, is the largest of these islets and lies about a quarter of a mile south-westward of the south-eastern entrance point; a conspicuous ruin stands on the north-eastern slope of the islet, about a cable north-eastward of its summit. 5

Otočić Muljica (Muljica Velika), 43 feet (13^m1) high, scantily covered with grass, lies about 3 cables westward of Otočić Arkandel. There are safe passages between Hrid Muljica and Otočić Muljica, and between them and Otočić Arkandel, and also between them and the coast 10 northward.

The passage into Uvala Stari Trogir, round the eastern end of Otočić Arkandel, is about 1½ cables wide between the north-eastern extremity of that islet and Otočić Merara northward; the last mentioned islet is 36 feet (11^m0) high and lies close westward of the south-eastern entrance point of Uvala Stari Trogir, with a depth of 3½ fathoms (6^m9) in the fairway of the passage between. 15

Otočići Kosmači, the larger of which is 69 feet (21^m0) high and the smaller, close north-westward, 26 feet (7^m9) high, are rocky and lie on a bank, with depths of less than 6 fathoms (11^m0) over it, which extends about half a mile south-south-eastward from the south-eastern entrance point of Uvala Stari Trogir. These two islets are connected by a shallow bank. For anchorage, *see* page 276. 20

Rt Čovik lies about a mile eastward of the south-eastern entrance point of Uvala Stari Trogir. Otočić Murvica, 46 feet (14^m0) high, and bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which extends half a cable from its north-eastern side, lies about half a mile southward of Rt Čovik. 25

Lights.—A light is exhibited, at an elevation of 70 feet (21^m3), from an octagonal stone tower and dwelling, 58 feet (17^m7) in height, on Hrid Mulo, situated 2½ miles west-north-westward of Rt Ploča. 30



*Hrid Mulo lighthouse
(Original dated 1939.)*

A light is exhibited, at an elevation of 48 feet (14^m6), from an octagonal stone tower and dwelling, 24 feet (7^m3) in height, on Otočić Murvica (*Lat.* 43° 28' N., *Long.* 16° 03' E.).

Anchorage.—Small vessels, with local knowledge, can anchor in Uvala Borovica, sheltered from all but westerly winds. 35

Vessels can anchor in the outer, eastern part of Uvala Sičenica, sheltered from all but westerly winds, in a depth of about 14 fathoms

Charts 2774, 1440, 2158a.

Chart 2712, with plan of Drvenik channel.

(25^m6), sand, but are exposed to heavy squalls in a Bora and to a considerable sea in southerly and south-westerly winds. Small vessels can anchor, in a depth of about 8 fathoms (14^m6), with a hawser to the shore; and there is shelter from all winds in the north-western arm of the bay, but it is only accessible to small craft.

Uvala Stari Trogir, the largest and best of the bays in the western approach to Drvenički kanal, affords anchorage, in depths of from 11 to 17 fathoms (20^m1 to 31^m1), sand, in the north-eastern part of the bay, sheltered from all but westerly winds.

There is anchorage, in a south-westerly wind, in the bight on the northern side of Otočić Arkandel, in depths of from 8 to 14 fathoms (14^m6 to 25^m6), coarse sand, with a hawser to the shore.

If a small sailing vessel, running from northward for shelter eastward of Rt Ploča, misses the anchorage in Uvala Stari Trogir, she should proceed through Drvenički kanal to the inner part of Luka Drvenik.

Drvenički kanal.—This channel is entered between Rt Rat, the western extremity of Otok Drvenik Mali and Rt Čovik, about 1½ miles northward. The channel is about a mile wide in its narrowest part and, at its eastern end, enters Splitski kanal between the eastern extremity of Otok Drvenik Veliki and Rt Jelinak, the western entrance point of Trogirski zaliv, about 3 miles northward.

Under ordinary circumstances there is a west-going current through Drvenički kanal at the rate of about half a knot. The Scirocco increases this rate, but after the cessation of that wind, a temporary east-going current makes itself felt in the channel.

In the fairway of the approach to the western entrance, there is a detached rocky bank, with a depth of 10 fathoms (18^m3) over it, which lies about a mile south-westward of Otočić Murvica, page 275.

On the southern side of the channel, the western end of the northern side of Otok Drvenik Mali is foul for a distance of about a cable offshore, and a shallow bank, about a cable wide, fringes the north-eastern side of the same island. Otočić Malta, 16 feet (4^m9) high and easily identified because of its light colour, lies about a mile eastward of Rt Tetivik, the north-eastern extremity of Otok Drvenik Mali. Mala luka, a narrow inlet, is situated on the north-western side of Otok Drvenik Veliki, about three-quarters of a mile south-eastward of Otočić Malta (*Lat.* 43° 27' N., *Long.* 16° 07' E.).

Luka Drvenik is entered between Rt Teketa, the northern extremity of Otok Drvenik Veliki and Rt Hljibi, about half a mile south-westward. The entrance points of this harbour are high and covered with trees; Sveti Nikola chapel stands on the south-western side of the harbour. The town of Drvenik, with the village of Grabule a short distance westward, is situated at the head of the harbour. In 1931, Drvenik contained 1,300 inhabitants.

On the northern side of the channel, Uvala Riševo (Voluja) is entered between Rt Čovik and a point about three-quarters of a mile east-north-eastward. Rt Artatur lies about 3 miles eastward of Rt Čovik. Luka Vinišće is entered between Rt Artatur and a point about 2 cables northward; round the shores of this inlet, there are several houses and a factory. For anchorage, *see* page 277.

Hrid Vinišće (Mandoler), 10 feet (3^m0) high, bare and light in colour,

Charts 2774, 1440, 2158a.

Chart 2712, with plan of Drvenik channel.

lies about 2 cables east-south-eastward of Rt Artatur. The coast between Rt Čovik and Rt Jelinak is bold and moderately steep-to.

On the northern side of the fairway of the eastern approach to Drvenički kanal, there are two rocky shoals, about 2 cables apart, the northern with a depth of $4\frac{1}{2}$ fathoms (8^m7) over it, and the southern with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it; they lie about 6 cables eastward of Hrid Vinišće (*Lat.* $43^\circ 29' N.$, *Long.* $16^\circ 08' E.$). Eastward of these two shoals, there are a number of islets in the south-western approach to Trogirski zaliv. Otočić Kluda, 148 feet (45^m1) high, the largest of these islets, lies about $1\frac{1}{2}$ miles eastward of Hrid Vinišće and $4\frac{1}{2}$ cables off the coast northward. This islet is rugged, steep, and in places covered with brushwood; it is surrounded by a narrow shallow bank, and depths of less than 4 fathoms (7^m3) extend about a cable from its south-eastern end. Two above-water rocks lie off the western side of the islet, one at a distance of about $1\frac{1}{2}$ cables, and the other at about a cable; and there is a rock, 30 feet (9^m1) high, close off its north-western extremity. A vessel should not pass between these rocks and the western side of the islet.

Otočić Pišćena Velika (Zaporin), 79 feet (24^m1) high, with Otočić Pišćena Mala, 62 feet (18^m9) high, close eastward and connected to it by a shallow bank, lies about $1\frac{1}{2}$ cables east-south-eastward of Otočić Kluda. These two islets are of a light green colour. Otočić Galera lies about a quarter of a mile eastward of Pišćena Mala. The islets lying east-north-eastward of Otočić Galera are described on page 278.

Lights.—The light on Otočić Murvica, at the western end of Drvenički kanal, is described on page 275.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 18 feet (5^m5) in height, on the eastern side of Luka Drvenik.

A light is exhibited, at an elevation of 37 feet (11^m3), from a white conical iron tower, 28 feet (8^m5) in height, on Otočić Galera (*Lat.* $43^\circ 28' N.$, *Long.* $16^\circ 11' E.$).

Anchorage.—**Directions.**—There are depths of 8 feet (2^m4) alongside the quay on the eastern side of Luka Drvenik, near its head.

Small vessels, with local knowledge, can find shelter from all winds in Mala luka.

Luka Vinišće affords shelter to small vessels from all winds, in depths of from 4 to 10 fathoms (7^m3 to 18^m3), abreast some dwellings on the north-eastern side of the inlet. A vessel, when approaching, may pass on either side of Hrid Vinišće.

A vessel, entering Drvenički kanal from westward, should pass between Otočić Murvica and Otok Drvenik Mali; entering from eastward, she should close the coast of Otok Drvenik Veliki in order to leave the islets, rocks and shoals, in the approach to Trogirski zaliv, on her northern side. During a Bora there are violent squalls in this channel. The Scirocco blows through the channel, causing a sea.

A sailing vessel from westward should not use this channel in a strong Bora, but should lie-to under Otok Drvenik Veliki and Otok Šolta or seek an anchorage, preferably in Uvala Vela Rina.

Prohibited anchorage.—Anchorage is prohibited in the part of Luka Drvenik on account of submarine cables.

Trogirski zaliv.—**Islets in approach.**—Trogirski (Trogir) zaliv lies on the northern side of Splitski kanal; a number of islets lie in the approach east-north-eastward of Otočić Galera, mentioned above,

Chart 2712, with plan of Drvenik channel.

Otočić Pijavica (Piavice), 30 feet (9^m1) high, bare and light in colour, lies about a quarter of a mile north-eastward of Otočić Galera ; it is surrounded by a narrow bank, which has a depth of only 1½ fathoms (2^m7) over its south-eastern end. Otočić Balkun, with an above-water rock close eastward, lies on a shallow bank which extends from 2 to 4 cables east-south-eastward of Otočić Pijavica. Two rocky patches, about 3 cables apart, the western, with a depth of 10 fathoms (18^m3) over it, and the eastern, with a depth of 11 fathoms (20^m1) over it, lie about 10 half a mile southward of Otočić Balkun.

Three islets lie on a bank, with depths of less than 10 fathoms (18^m3) over it, which extends about 3 cables south-westward and then 1½ miles westward from a point, on the southern side of Otok Čiovo, situated about 2½ miles east-north-eastward of Otočić Galera. Otočić Zaporinovac, near the western end of the bank, is 20 feet (6^m1) high and has a shallow bank extending a short distance off its western end ; Otočić Kraljevac, 112 feet (34^m1) high, with a few trees on it, and Otočić Sveta Fumija (Eufemija), 108 feet (32^m9) high, wooded and cultivated on its northern side, lie farther eastward ; there is a depth of 2 fathoms (3^m7) over the bank between the eastern end of the latter islet and the coast of Otok Čiovo northward. Rt Rat, a projection on the southern side of Otok Čiovo, lies about 3 cables east-north-eastward of the eastern end of Otočić Sveta Fumija. The depths between these islets can best be seen on the chart. For anchorage in Uvala Fumija, northward of Otočić Sveta Fumija, *see* page 282.

Chart 2712.

Trogirski zaliv is entered between Rt Jelinak, page 276, and Rt Okrug, the western extremity of Otok Čiovo, about 1½ miles eastward ; a shallow bank extends 1½ cables westward from Rt Okrug. In Uvala Raščine, situated about 3 cables south-eastward of Rt Okrug, there is a wooden mole and a mooring buoy.

There is secure anchorage at either end of Trogirski zaliv. The town of Trogir lies at the north-eastern end of the bay, where Trogirski kanal leads into Kaštelanski zaliv.

Otočić Čelice (Čeline), 36 feet (11^m0) high, lies just within the entrance, about half a mile north-westward of Rt Okrug. Detached, rocky shoals, with depths of from 2 to 5 fathoms (3^m7 to 9^m1) over them, lie within a distance of about 4 cables north-westward, northward and east-north-eastward of Otočić Čelice. The steeples of the Cathedral and Sveti Mihovil church, at Trogir, in line, bearing 065°, leads between Rt Okrug and Otočić Čelice. *See* view facing page 279. The Cathedral is conspicuous.

Light.—A light is exhibited, at an elevation of 49 feet (14^m9), from a red conical iron tower, 25 feet (7^m6) in height, on Otočić Čelice (*Lat.* 43° 30' N., *Long.* 16° 12' E.).

Marinski zaliv.—**Lights.**—Marinski zaliv is the western arm of Trogirski zaliv and is entered between Rt Jelinak and Rt Vranjica, about three-quarters of a mile northward. The bay is completely sheltered by high land, which rises to an elevation of 938 feet (285^m9), 1½ miles westward of Rt Jelinak, and its shores are backed northward by high mountainous land, the seaward slopes of which are covered with cultivation. The village of Marina lies at the head of the bay. The depths in the bay gradually decrease towards the village.

It is difficult with contrary winds for a sailing vessel to work into

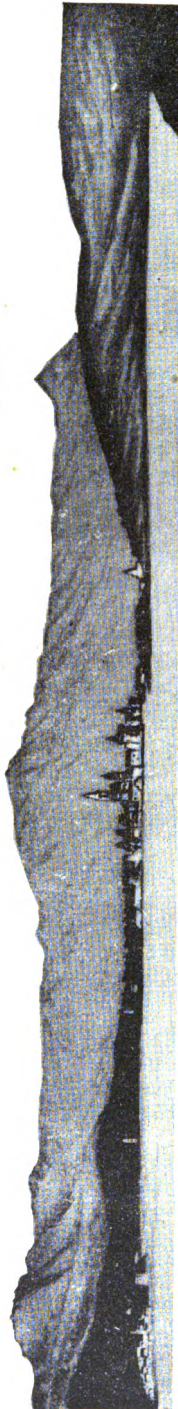
Charts 1440, 2158a.

To face page 279.

Bizanj.

Kosjak.

Sveti Jure.



Segd.

Trogir. R. Čiprijan.

Zaliv Saldun.

Rt Otrug.

The Cathedral and Sv. Mihovil steeples in line, bearing 065°, lead between Rt Otrug and Otočić Čelice.

Trogirski zaliv.

(Original dated 1910.)

Chart 2712.

this bay, on account of the islets and rocks off-lying the entrance to Trogirski zaliv and within that entrance, and impracticable to leave it with winds between north-east and south-east.

A light is exhibited, at an elevation of 49 feet (14^m9), from a red conical iron tower, 25 feet (7^m6) in height, on Pasji rat, on the southern side of Marinski zaliv, about 2½ miles west-north-westward of Rt Jelinak.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m6) in height, on the quay at Marina (*Lat.* 43° 31' N., *Long.* 16° 07' E.).

Anchoragees.—Vessels can anchor half way between the sides of Marinski zaliv, in a depth of 7 or 8 fathoms (12^m8 or 14^m6). Small craft, with local knowledge, can moor in the various creeks and off the village; in a Scirocco, the best anchorage for them is in Uvala Šašina (Vranica), situated close westward of Rt Vranjica. There are depths of about 7 feet (2^m1) alongside the quay at Marina.

Charts 1612, plan of Port Trogir, 2712.

Zaliv Saldun.—Light.—Anchorage.—Zaliv Saldun is situated at the south-eastern end of Trogirski zaliv and is entered between Rt Okrug and Rt Čiprijan, the north-western extremity of Otok Čiovo, about 1½ miles north-eastward. A bank, with a depth of 2½ fathoms (4^m6) over its outer edge, extends about a cable southward of Rt Čiprijan. See view facing this page.

A light is exhibited, at an elevation of 22 feet (6^m7), from a red hut, 23 feet (7^m0) in height, on Rt Čiprijan (*Lat.* 43° 31' N., *Long.* 16° 14' E.).

Vessels of deep draught can anchor near the middle of Zaliv Saldun, in a depth of 14 fathoms (25^m6), sand and mud, with Rt Čiprijan bearing about 346°, distant half a mile. Small vessels can find good anchorage under the northern and southern shores of the bay.

Trogirski kanal and approaches.—This channel, in the fairway of which there is a least depth of 2½ fathoms (4^m6), connecting Trogirski zaliv with Kaštelanski zaliv, is situated between Otok Čiovo and the mainland northward and is spanned by a swing bridge; the depth under the bridge is sufficient to permit vessels with a 16-foot beam and drawing about 15 feet (4^m6) to pass through it, and vessels, with local knowledge, drawing up to 14 feet (4^m3) can pass through this channel.

The town of Seget, which contained 3,700 inhabitants, in 1931, lies on the northern side of the approach to Trogirski kanal, about a mile westward of the swing bridge.

The normal current is west-going in the channel; its rate is very variable and may exceed 3 knots.

Lights.—Beacons.—Buoyage.—The channel is marked by buoys and beacons.

Two lights are exhibited, each at an elevation of 17 feet (5^m2), from an iron column, 7 feet (2^m1) in height, situated one on each pier of the swing bridge. These lights show *green* when the bridge is shut and *red* when it is open.

Two light-buoys, the western exhibiting a *green fixed* light, showing a *green flash every two seconds*, and the eastern, a *white fixed* light, *flashing every two seconds*, are moored on the northern side of the channel, one a short distance north-eastward of the swing bridge, and the other about a mile east-north-eastward of it.

Charts 1440, 2158a.

Charts 1612, plan of Port Trogir, 2712.

A light is occasionally exhibited from a mast on the head of the mole at Divulje, situated on the mainland, about $2\frac{1}{4}$ miles east-north-eastward of Rt Čiprijan.

- 5 **Prohibited areas.**—Navigation and anchorage are prohibited in an area, indicated on the chart by pecked lines, in the eastern approach to Trogirski kanal, from $1\frac{1}{4}$ to $3\frac{1}{4}$ miles eastward of the swing bridge.

- Anchorage is prohibited near a submarine cable, indicated on the
10 chart, which crosses the channel close westward of the swing bridge. The shore ends of the cable are each marked by a black board with a white anchor painted thereon.

- Anchorages.**—Vessels may anchor in the fairway of Trogirski kanal, about $1\frac{1}{4}$ cables eastward of Rt Čiprijan, in a depth of 5 fathoms
15 (9^m1). Farther in the depths are less but vessels of shallow draught can anchor in the channel with sternfasts to Otok Čiovo, the bottom is mud; or lie alongside the southern quay at the town of Trogir (*Lat. 43° 31' N., Long. 16° 15' E.*).

- A breakwater, to which small vessels can secure, extends a short
20 distance southward from Seget; there are depths of 9 feet (2^m7) at the head of the breakwater.

- Town.**—The town of Trogir, which had a population of 3,710, in 1931, is built on an islet which is connected with the mainland by a bridge over a narrow passage, in which there is a depth of 6 feet (1^m8);
25 it is also connected with the suburb of Čiovo, on the northern side of Otok Čiovo by a swing bridge. The arms of the swing bridge open eastward, and the width between the piers is 62 feet (18^m9); it is opened on the approach of a vessel, in daytime, between 0500 and 1900 in summer, and between 0600 and 1700 in winter; at night it is opened
30 by request at the harbour office.

Fresh provisions can be obtained.

Chart 2712, with plan of Drvenik channel.

- Directions.**—When approaching Trogirski zaliv from any quarter, Vlačka, a mountain, 1,486 feet (452^m9) high, about 2 miles west-north-
35 westward of Trogir, will be easily identified.

- When approaching from south-eastward by Splitski kanal, the opening between Rt Jelinak and Rt Okrug will be easily distinguished. A vessel, after passing Pličina Mačina, page 281, should steer for Rt Okrug and pass southward and westward of the three islets Sveta
40 Fumija, Kraljevac and Zaporinovac; the last should be kept aboard to avoid the shoal extending eastward of Otočić Balkun. When Rt Vranjica, which is hilly, is seen it should be steered for. A vessel bound for Marinski zaliv should pass at a prudent distance southward and westward of Otočić Čelice and if proceeding to Zaliv Saldun or
45 Trogir, she should steer for a position about 3 cables westward of Rt Okrug and bring the steeples of the Cathedral and Sveti Mihovil church, at Trogir, in line, bearing 065°, and after passing between Rt Okrug and the 4-fathom (7^m3) patch lying east-north-eastward of Otočić Čelice, on that course, she may shape course for the desired
50 anchorage. See view facing page 279. When approaching Trogirski kanal, Rt Čiprijan should be given a berth of a cable.

A vessel approaching Trogirski zaliv from westward, may keep close along the coast until abreast Rt Jelinak, whence she should proceed as directed above.

Charts 1440, 2158a.

Chart 2712.

Splitski kanal.—This channel, situated between Otok Šolta, on its southern side, and Otok Čiovo, with the islets off-lying the south-western end of that island, on its northern side, is wide and easily navigated, the current not being very strong. Under ordinary conditions, an east-going and west-going tidal stream is noticeable, changing with the tides ; but they are influenced by the prevailing winds. The bottom of the channel consists of mud throughout, excepting some patches of rock at its western end, one at the north-eastern end of Šoltanski kanal, mentioned on page 273, and two in the eastern approach to Drvenički kanal, off Otočić Balkun, mentioned on page 278, and, at its eastern end, in the south-eastern approach to Kaštelanski zaliv, mentioned on page 266.

On the southern side of the channel, the northern coast of Otok Šolta is exposed to the full force of northerly and north-easterly winds and there are only three coves which afford any shelter.

On the northern side, the islets and rocks lying in the approach to Trogirski zaliv are described on pages 277 and 278. The southern side of Otok Čiovo, between Rt Rat, page 278, and Rt Jove, the eastern extremity of the island, is rocky and steep almost throughout, and is steep-to.

Uvala Movarštica (Mavarstica) is entered about $1\frac{1}{4}$ miles east-north-eastward of Rt. Rat. For anchorage, *see* page 282.

On the southern side of the channel, Uvala Rogač is the eastern of two coves entered between a point about $4\frac{1}{4}$ miles east-south-eastward of Rt Obinuš, page 272, and a point, about 4 cables farther east-south-eastward. There is a basin formed by two small moles, and there are some buildings on the shore. The village of Grohote lies three-quarters of a mile inland. The position of this cove can be distinguished by a depression in the island and the low land eastward of it ; from eastward, by the church tower of Grohote ; near the coast a grotto can be seen westward of the cove.

Uvala Nečujam is entered between points lying about half a mile and one mile, respectively, east-south-eastward of the eastern entrance point of Uvala Rogač. (*Lat.* $43^{\circ} 24' N.$, *Long.* $16^{\circ} 18' E.$).

Uvala Stomorska lies about $1\frac{1}{4}$ miles south-eastward of Uvala Nečujam and about a quarter of a mile westward of Rt Pelegrin, page 269 ; the village of Stomorska lies round the head of the cove. For anchorage in these coves, *see* page 282.

On the northern side of the channel, Kaštelanski zaliv is entered between Rt Jove and Rt Marjan (St. Jure), on the mainland, about $1\frac{1}{4}$ miles northward. Off the coast between Rt Marjan and Rt Sustipan, the western entrance point of Splitska luka, about 2 miles eastward, the bottom of the channel consists partly of mud and partly of rock.

Danger.—Beacon.—Pličina Mačina, a rocky patch, with a depth of less than one foot (0^m3) over it, is the only danger in Splitski kanal. It lies nearly in the middle of the western part, about $2\frac{1}{4}$ miles east-north-eastward of Otočić Krknjaš Mali, page 273, and is steep-to. A small bank, with a depth of 6 fathoms (11^m0) over it, lies about half a mile west-north-westward of this shoal.

A white iron staff, 10 feet (3^m0) high, surmounted by a framework ball, marks this shoal, but it is liable to be washed away and cannot be relied upon.

Chart 2712.

Lights.—The light on Otočić Galera is described on page 277.

A light is exhibited, at an elevation of 39 feet (11^m9), from an iron column, 20 feet (6^m1) in height, on Rt Glavica, the western entrance point of Uvala Rogač.

The light on the eastern entrance point of Uvala Stomorska (*Lat.* 43° 22' N., *Long.* 16° 21' E.), is described on page 270.

Anchorage.—Uvala Fumija, situated between Otočić Sveta Fumija and the south-western side of Otok Čiovo, is frequented by small craft which can anchor, in depths of from 6 to 9 fathoms (11^m0 to 16^m5), northward of the islet. This anchorage is convenient for sailing vessels meeting contrary winds in Splitski kanal, and is more suitable than Uvala Movarštica, being sheltered from easterly and southerly winds; it has two entrances, the eastern being over the 2-fathom (3^m7) bank which unites Otočić Sveta Fumija and Otok Čiovo.

Uvala Movarštica is a convenient anchorage for small vessels in a Bora; the holding ground of sand is good, and there are suitable boulders to which hawsers can be made fast.

In Uvala Rogač vessels of moderate size can anchor south-eastward of the light-column on the western entrance point, and lay out a hawser to the eastern shore on account of the limited swinging room. There are depths of 16 fathoms (26^m3) in the entrance and 8 fathoms (14^m6) near the head of the cove; the bottom consists of sand. Small vessels can moor in the basin.

In Uvala Nečujam, there is more room than in Uvala Rogač and this harbour can be used by larger vessels in southerly and westerly winds. There is anchorage, in depths of from 9 to 15 fathoms (16^m5 to 27^m4), somewhat protected from north-easterly winds. This is the only anchorage for large vessels in Otok Šolta. Vessels can anchor in the middle of the harbour; in the bad season, nearer the eastern side, with a hawser to the shore. The holding ground is good. Small vessels can moor in the south-western cove at the head of the harbour.

Small vessels, with local knowledge, can find shelter from all winds in Uvala Stomorska; vessels drawing up to 7 feet (2^m1) can secure to the quay on the eastern side of this harbour.

Otok Čiovo.—This island lies between Trogirski zaliv and Kaštelanski zaliv, forming the south-westward side of the latter bay. It is 715 feet (217^m9) high in the centre and the major portion is covered with low shrubs; the lower ground is cultivated.

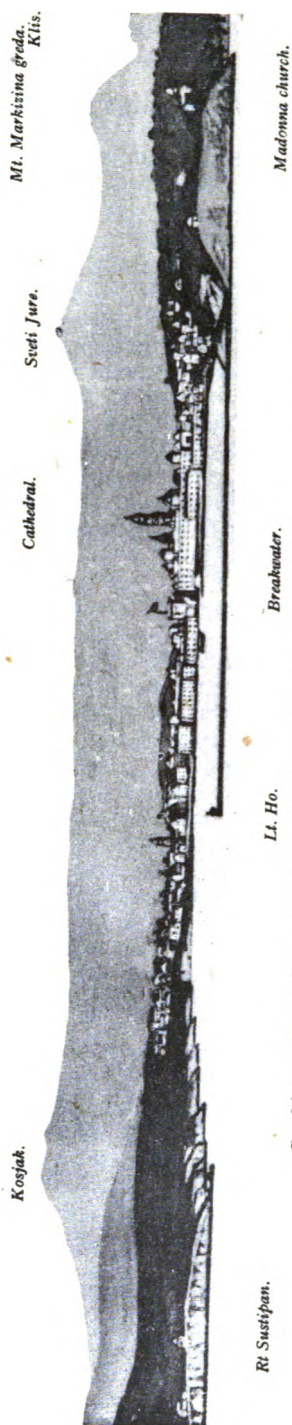
Chart 1612, plan of Port Split.

Splitska luka.—**Buoys.**—This harbour is entered between Rt Sustipan (Sustjepan), about 2 miles eastward of Rt Marjan, page 281, and the head of a breakwater, extending from the eastern side of the entrance, about 2½ cables farther eastward. The northern, north-western and western sides of the harbour are bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, about a cable wide; the inner part of this bank is rocky for the distance of about half a cable offshore. A reef lies on this bank from half a cable to one cable northward of Rt Sustipan, and a shallow bank extends about a quarter of a cable eastward of that point. The outer edge of a bank, which extends from the south-eastern corner of the harbour, close northward of the root of the breakwater, is marked by two buoys.

It was reported, in 1937, that the depths in the harbour were slightly greater than those indicated on the chart.

Charts 1440, 2158a.

To face page 283.



Split, bearing 000° , distant three-quarters of a mile.
(Original dated 1910.)

Chart 1612, plan of Port Split.

Breakwaters.—Moles.—A breakwater extends about $2\frac{1}{2}$ cables from the eastern side of the entrance ; from near the inner end of this breakwater, a quay-wall, with depths of from 12 to 18 feet (3^m7 to 5^m5) alongside, extends along the eastern side of the harbour and terminates at Mletački mole, 3 cables northward ; this mole projects about half a cable westward, and has depths of from 9 to 15 feet (2^m7 to 4^m6) alongside. Two moles, the southern named Sveti Duje, and the northern Sveti Petra, project from the eastern side of the harbour ; there are depths of from 18 to 21 feet (5^m5 to 6^m4) alongside these moles. Vessels can also berth alongside the breakwater where the depths exceed 24 feet (7^m3). 5

A breakwater, extending northward of Rt Sustipan, was under construction, in 1931, and navigation westward of it is prohibited.

From the western part of the town, a small mole projects towards Mletački mole, leaving an opening about a cable wide into a small inner harbour, lined with quays, in which there are depths of from 6 to 12 feet (1^m8 to 3^m7). See view facing this page. 15

Berths.—In 1945, there were two berths in the harbour, each 459 feet (139^m9) long ; one of these, on the northern side of the eastern breakwater, was available for vessels drawing from 26 to 28 feet (7^m9 to 8^m5) ; the other, alongside Sveti Petra mole, was available for vessels, drawing from 20 to 21 feet (6^m1 to 6^m4). 20

The other berths in the harbour were only available for vessels drawing up to 14 feet (4^m3). 25

Light.—Fog signal.—A light is occasionally exhibited, at an elevation of 35 feet (10^m7), from a white octagonal iron tower, on a dwelling, 31 feet (9^m5) in height, on the head of the eastern breakwater (Lat. $43^{\circ} 30' N.$, Long. $16^{\circ} 26' E.$). 30

A fog signal is sounded from this lighthouse in reply to the fog signals of an approaching vessel. 35



Eastern breakwater lighthouse.

Anchorage.—The roadstead off Split affords anchorage in depths of from 22 to 27 fathoms (40^m2 to 49^m4), mud, good holding ground, from 2 to 6 cables southward of the eastern breakwater, but it is not a desirable anchorage in winter. Luka Poljud, page 285, affords better shelter in that season as the Bora is less felt there. 40

The harbour is well sheltered from all winds except those from south-westward, but there is little room in it for large vessels. Vessels moor to the quays and moles as directed by the Harbour authorities ; small vessels can lie inside Mletački mole. There is anchorage in depths of from 4 to 5 fathoms (7^m3 to 9^m1), mud and shells. 45

Prohibited anchorage.—Anchorage is prohibited in Splitska luka eastward of a line, indicated on the chart, joining Rt Sustipan and the north-western corner of Mletački mole.

Port regulations.—All in-coming steamers must reduce speed before passing an imaginary line between the lighthouse on the head of the eastern breakwater and Rt Sustipan. Out-going steamers must manœuvre at reduced speed before passing this line. Sailing and rowing boats moving in the inner harbour must keep out of the way of out-going vessels, whether steamers or sailing vessels. 50

Charts 2712, 1440, 2158a.

Charts 1612, plan of Port Split, 2712.

Directions.—Marjan, a hill, 584 feet (178^m0) high, the summit of the promontory lying westward of Split, and the castle at Klis, about 5 miles north-eastward of Split are good guides to the harbour from a distance; on nearer approach Gospa od Pojišana, elevated 62 feet (18^m9), about 6½ cables east-north-eastward of the lighthouse on the eastern breakwater, and the numerous buildings and steeples in the town will be seen. A large vessel, approaching from eastward, should avoid the 4½-fathom (8^m7) patch lying 2 miles south-eastward of the lighthouse on the eastern breakwater and about a mile offshore, mentioned on page 266. There is no difficulty in entering the harbour.

If a vessel is surprised by a Bora in this neighbourhood and is unable to reach Split or an anchorage in Kaštelanski zaliv, she should bear up for the western side of Otok Brač.

Chart 1612, plan of Port Split.

Town.—The town of Split is the capital of a department and the most important commercial town in the vicinity; it contained 35,417 inhabitants, in 1931. It is situated on the northern and north-eastern sides of the harbour. The outer walls of the Emperor Diocletian's palace, which form a square, still exist to a great extent, and enclose a large part of the town. The cathedral is conspicuous. There are several suburbs in the vicinity, and the land is cultivated. Cattle, bauxite, maize, oil, timber, marble and wine are exported.

Communications.—**Port facilities.**—Split (*Lat.* 43° 30' N., *Long.* 16° 26' E.) is connected to the general railway system. The port is in frequent steamer communication with other ports in the Adriatic and Mediterranean.

A supply of coal cannot be relied upon; the local steamers coal alongside Sveti Duje mole where a stock is maintained for them. Water is laid on to Sveti Petra mole or can be obtained from a steam tank vessel with a capacity of 200 tons at the rate of 60 tons an hour.

No cranes were available for working cargo, in 1945.

Fresh provisions are plentiful.

Small repairs to vessels can be executed.

There is a floating dock, for details of which see Appendix I, page 601. In 1943, this floating dock was one of the two moored in Uvala Supaval, page 285.

Chart 2712.

Kaštelanski zaliv.—Kaštelanski (Kastel) zaliv is entered between Rt Jove and Rt Marjan, page 281; a bank, with depths of 3 fathoms (5^m5) over it, which is steep-to, extends half a cable from the latter point. With this exception, the entrance is free from dangers, but in bad weather, vessels should be prepared for heavy squalls from the high land.

This bay is landlocked, and is formed within the promontory extending westward from Split and the north-eastern side of Otok Čiovo. It is sheltered from northerly winds by the high land near the coast; but in general this bay is exposed to the Bora and Scirocco, which sometimes blows strongly; the coast of Otok Čiovo, between Rt Jove and the swing bridge at the town of Trogir, being quite exposed, affords no shelter.

The position of this bay can be identified by Marjan hill, which is barren and appears from the offing to be detached from the adjacent

Chart 2712.

land. The tower of the convent church at the village of Poljud, situated at the head of Luka Poljud, is visible from a considerable distance.

The village of Solin, which is connected to the railway system, is situated at the eastern end of the bay and stands on the ruins of an ancient city. A river, which is navigable by boats, rises in the mountains above the village of Klis, about $2\frac{1}{2}$ miles north-eastward of Solin, and flows into the bay here.

There are several villages on the northern shore of the bay. Kaštel Novi, the westernmost of these villages, is situated about $6\frac{1}{2}$ miles westward of Solin; these villages all have either artificial harbours, suitable for small craft, or quays to which vessels can secure. The mole at Divulje is mentioned on page 280.

The north-western and northern sides of Kaštelanski zaliv are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it; this bank is about half a mile wide off Rt Taršće, situated about $4\frac{1}{2}$ miles north-westward of Rt Jove, and is narrower farther eastward. Westward of Rt Taršće and a point about three-quarters of a mile southward, the sides of the bay, which are bordered by banks, converge, forming the eastern approach to Trogirski kanal.

The south-eastern side of the bay is indented. Luka Poljud is entered between a point, about three-quarters of a mile east-north-eastward of Rt Marjan (*Lat. $43^\circ 30'$ N., Long. $16^\circ 23'$ E.*), and Rt Rat, about a mile farther east-north-eastward. Between a point about three-quarters of a mile north-eastward of Rt Rat and a point, about 3 cables farther east-north-eastward, there are two coves, separated by a projection on which there is a shipyard with several slipways and three jetties. Uvala Luka is the western cove and Uvala Supaval, in which there are some mooring buoys, is the eastern. A shallow bank, on the outer part of which there are some above-water rocks, extends about $1\frac{1}{2}$ cables north-north-eastward from the western entrance point of Uvala Luka.

In 1943 there were two floating docks in Uvala Supaval.

At the eastern end of Kaštelanski zaliv, there are two bays divided by a promontory, on which is the village of Vranjic with a conspicuous church; the harbour of Solin is situated on the northern side of the promontory and that of Vranjic, on the southern side. Vranjic contained 1,100 inhabitants, in 1931.

A number of rocks and shoals encumber the eastern part of the bay.

Dangers.—Beacons.—A detached, rocky shoal, with a least depth of $3\frac{1}{2}$ fathoms (6^m4) over it, lies in the south-western part of Kaštelanski zaliv, about $3\frac{1}{2}$ miles north-westward of Rt Jove and from 4 to 9 cables off the coast of Otok Čiovo. There is rocky ground about $1\frac{1}{2}$ miles north-eastward of this shoal.

A rocky bank lies, with its western end, over which there is a depth of $6\frac{1}{2}$ fathoms (11^m4), about a quarter of a mile south-south-eastward of Kaštel Lukšić, situated about $1\frac{1}{2}$ miles eastward of Kaštel Novi. There is rocky ground about a quarter of a mile south-westward of the western end of this bank.

Hrid Galija (Galiera), 6 feet (1^m8) high, lies about 6 cables northward of Rt Rat. A detached shallow patch, marked by a conical stone beacon, 9 feet (2^m7) high, surmounted by a framework ball, lies about

Charts 1440, 2158a.

Chart 2712.

2 cables westward of Hrid Galija ; a 2-fathom (3^m7) patch lies about 2 cables south-westward of the beacon.

- A rock, 6 feet (1^m8) high, lies about 2 cables westward of Rt Rat, with depths of from 4 to 6 fathoms (7^m3 to 11^m0) between it and the point. A shallow spit extends about half a mile south-westward from Rt Rat, with a depth of one fathom (1^m8) at its extremity, which is marked by an iron perch, 10 feet (3^m0) high, surmounted by a white framework ball.
- 10 Hrid Šile, on which there is a light-column, lies half a mile eastward of Hrid Galija and about the same distance offshore. There is a detached 4-fathom (7^m3) patch midway between Hrid Šile and Rt Rat.

- Otočić Barbarinac (Otočac), 26 feet (7^m9) high, and covered with trees, lies on a shallow bank extending about 3 cables off the western end of the northern side of the harbour of Solin, from about a mile to 1½ miles from its head. A detached 3½-fathom (5^m9) patch, lies about 4 cables eastward of Otočić Barbarinac and 2 cables offshore.

- Lights.**—A light is exhibited, at an elevation of 26 feet (7^m9), from a red iron tower, 21 feet (6^m4) in height on Rt Marjan (*Lat.* 43° 30' N., *Long.* 16° 23' E.).

A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron column on a white stone base, 18 feet (5^m5) in height, on Hrid Šile.

- A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column, 17 feet (5^m2) in height, on the western corner of the cement factory quay at Vranjic.

A light is exhibited, at an elevation of 44 feet (13^m4), from the cement factory at Sveti Kajo, situated on the northern side of the harbour of Solin, about 6 cables westward of its head.

- 30 A light is exhibited, at an elevation of 33 feet (10^m1), from a wooden post, 28 feet (8^m5) in height, situated on the western corner of a quay, on the northern side of Kaštelanski zaliv, about 3½ cables north-westward of Otočić Barbarinac and half a mile south-eastward of Kaštel Sućurac, which lies about 4 miles eastward of Kaštel Novi.

- 35 A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 12 feet (3^m7) in height, situated on the head of the mole at Kaštel Novi.

- A light is exhibited, at an elevation of 20 feet (6^m1), from a grey iron column, 12 feet (3^m7) in height, on the molehead at Slatine, situated on the north-eastern side of Otok Čiovo, about 2½ miles west-north-westward of Rt Jove.

The light on the molehead at Divulje is described on page 280.

- Anchorage.**—**Quays.**—A sea is caused by every strong wind, but with good ground tackle a vessel is secure enough, as the bottom, with the exception of the rocky places mentioned previously, is good holding ground everywhere. Vessels do not anchor off the coast of Otok Čiovo, as the Bora and Scirocco blow stronger there than anywhere else in the bay. The best place for large vessels is Luka Poljud, or about 3 cables southward of Kaštel Sućurac ; small vessels can anchor off the villages and those with local knowledge moor in the artificial harbours.

In Luka Poljud there is a small mole for boats in its north-eastern corner, close to the convent. The shores of the harbour are bordered by a bank, with depths of less than 4 fathoms (7^m3) over it, which is

Chart 2712.

as much as 3 cables wide at its head, and the northern side of its entrance is obstructed by the shoal extending from Rt Rat, previously mentioned; between this shoal and the shore bank, south-eastward, there are depths of about 8 fathoms (14^m6). There is anchorage for small vessels, with local knowledge, in the north-eastern part of this bay, about a quarter of a mile off the mole. Large vessels can anchor about 4 cables westward of the above-water rock off Rt Rat and half a mile northward of the south-western entrance point of the harbour, in depths of from 15 to 18 fathoms (27^m4 to 32^m9), mud. 5 10

Luka Poljud is the quarantine anchorage for Split.

On the southern side of the extremity of the promontory separating the harbours of Vranjic and Solin, there is a quay for small craft. About 3 cables eastward of the town, on the same side of the promontory, there is a quay to which larger vessels can secure; the depths alongside this quay are from 7 to 20 feet (2^m1 to 6^m1), but they increase rapidly to more than 33 feet (10^m1) at a short distance off. 15

The harbour of Vranjic, in which there are depths of from 4 to 8 fathoms (7^m3 to 14^m6), affords good anchorage for small vessels in the prevailing winds, southward of the town, with a hawser to the shore; the head of this harbour is shallow. When approaching this anchorage, by bringing the church to bear 096° and steering for it, a vessel gives a berth of 1½ cables to the rocks off the northern side of the approach. 20

The harbour of Solin is used only by small vessels as an anchorage. Its shores are low and bordered by a narrow, shallow bank; the 3½-fathom (5^m9) patch in the middle of the entrance has already been mentioned. Vessels can anchor in the middle of this harbour in depths of 7 and 8 fathoms (12^m8 and 14^m6), mud, good holding ground, but they are exposed to the Bora. The quay at Sveti Kajo is available for vessels drawing up to 26 feet (7^m9). Here there is a movable crane capable of loading 800 tons of cement in 24 hours. 25 30

Ilicev gat, close eastward of Sveti Kajo quay, is 295 feet (89^m9) long and is available for vessels drawing from 23 to 25 feet (7^m0 to 7^m6). 35

An oiling jetty, available for tankers up to 10,000 tons, drawing from 28 to 29 feet (8^m5 to 8^m8), is situated close eastward of Ilicev gat.

Alongside the quay situated half a mile south-eastward of Kaštel Sućurac, which is 689 feet (210^m0) long, there are berths for one vessel, drawing from 26 to 29 feet, (7^m9 to 8^m8), and another vessel, drawing from 23 to 25 feet (7^m0 to 7^m6). Cranes are available for working cargo; there are some mooring buoys off this quay. Vessels drawing up to 17 feet (5^m2) can secure to a quay on the northern shore, situated about three-quarters of a mile westward of Kaštel Sućurac. These two quays are not suitable for small craft. 40 45

Small craft, drawing up to 10 feet (3^m0), can secure to the outer part of the mole at Slatine (*Lat.* 43° 30' N., *Long.* 16° 20' E.).

Prohibited area.—See page 280.

Charts 1440, 2158a.

CHAPTER VII

COAST OF YUGOSLAVIA FROM RT PLOČA TO RT ARTIĆ, AT THE NORTH-
WESTERN END OF ZADARSKI KANAL, WITH ADJACENT ISLANDS.

Chart 2774.

COAST.—Between Rt Ploča and Rt Artić, about 60 miles north-westward, the coast has numerous indentations affording good anchorage, with many off-lying islands and rocks. The Bora often blows with great violence. The mountains which back this coast are precipitous and bare for the most part, with their bases seaward cultivated. Wine, oil, corn, figs, almonds, salt, wood, salt fish, &c., are produced, but fresh water is generally scarce.

Chart 2774, plan of Port Rogoznica.

Luka Rogoznica.—This harbour is sheltered from all winds by the barren hills which surround it. It is entered between Rt Konja, situated about $1\frac{1}{2}$ miles north-north-westward of Rt Ploča (*Lat. $43^{\circ} 30' N.$, Long. $15^{\circ} 58' E.$*), and Rt Gradina, about half a mile north-eastward. The harbour is divided into two parts by an islet, 233 feet (71^m0) high, on the north-western end of which lies the village of Rogoznica, which contained 860 inhabitants in 1931, and where there is a quay, with depths of 10 feet (3^m0) alongside. The northern end of this islet is joined to the mainland by a causeway. A sandbank, with a depth of 3 fathoms (5^m5) over its outer edge, and with an above-water rock on it, extends about a cable westward from the northern end of the islet.

Soline bay, at the head of the western part of Luka Rogoznica is shallow. On the southern side of the harbour, the village of Ražanj is situated near the head of a cove, about a mile east-south-eastward of Rt Konja. A shallow spit, on which there is an above-water rock, extends about $1\frac{1}{2}$ cables north-westward from the eastern entrance point of this cove.

The eastern part of Luka Rogoznica is roomy and its sides are fringed by a narrow, shallow bank. Uvala Stupin is situated in the north-eastern corner of this part.

There is regular steamer communication with Split and Šibenik.

Telegraph cable.—A submarine cable, indicated on the chart, crosses Luka Rogoznica from the southern end of the islet to the mainland southward.

Off-lying islets and dangers.—**Buoy.**—Hrid Mulo, 28 feet (8^m5) high, with a lighthouse on it, is the outer rock off Luka Rogoznica and lies about $1\frac{1}{2}$ miles westward of Rt Konja. It is nearly steep-to, except on its northern side, where it is bordered by a rocky bank, about half a cable wide. See view on chart 2774.

Charts 2712, 1440.

Chart 2774, plan of Port Rogoznica.

Otočić Smokvica Velika, 144 feet (43^m9) high and covered with trees and bushes, lies with its north-western end about 6 cables west-south-westward of Rt Konja; a shallow bank extends about a cable from its north-western end. Hrid Kalebinjak lies about a cable north-east-ward of the south-eastern end of this islet, with a clear passage, 2 cables wide, between the rock and the mainland north-eastward. 5

Otočić Smokvica Mala, 95 feet (29^m0) high and thinly covered with bushes, lies about 2 cables north-eastward of the north-western extremity of Otočić Smokvica Velika. A sunken rock, on which the sea breaks near its outer edge, lies on the outer end of a shoal, with depths of 4 fathoms (7^m3) over it, which extends about a cable from the western side of this islet. A rocky patch, with a depth of 3½ fathoms (5^m9) over it, and steep-to, lies about 3 cables west-north-westward of Otočić Smokvica Mala. 10 15

Pličina Veli Brak (Spaun rock), with a depth of 2½ fathoms (4^m6) over it, and surrounded by a rocky bank, with depths of less than 5 fathoms (9^m1) over it, about half a cable wide, lies about a mile north-north-westward of Hrid Mulo. The south-eastern side of this shoal is marked by a conical buoy, painted in red and black bands, and surmounted by two balls. 20

The southern extremity of the islet in Luka Rogoznica in line with Rt Gradina, bearing about 109°, leads about 3 cables north-eastward of Pličina Veli Brak, and the northern extremity of Rt Konja in line with the northern extremity of Otočić Smokvica Mala, bearing about 097°, leads southward of it. 25

Lights.—The light on Hrid Mulo is described on page 275.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 16 feet (4^m9) in height, on the outer end of the quay at Rogoznica (Lat. 43° 32' N., Long. 15° 58' E.). 30

Anchorage.—**Directions.**—Vessels can anchor westward of Rogoznica in depths of from 12 to 17 fathoms (21^m9 to 31^m1). Small craft moor on the western side of the islet and secure to the shore at the southern part of the village; there are mooring bollards on the islet. The bottom generally is sandy and good holding ground, but there are some rocky patches north-eastward of Rt Gradina. 35

There is a mooring buoy off Rogoznica.

Small vessels can also moor in Ražanj cove, or in Uvala Stupin.

Uvala Movar, entered between Rt Konja and Rt Movar, about half a mile southward, can be used as an anchorage in a Scirocco; the bottom consists of sand and is good holding ground. On a Bora springing up, a hawser should be laid out, north-eastward, to a boulder on the shore. 40

A large vessel, approaching from southward, can pass on either side of Hrid Mulo, but should not use the passage between Rt Konja and the islets off-lying it; a small vessel may take the latter passage, but should guard against the current. 45

Chart 2774.

Submarine exercise area.—There is a submarine exercise area in the north-western approach to Luka Rogoznica, the limits of which are indicated on the chart by pecked lines. See page 45. 50

Coast.—Between Rt Gradina and Rt Oštrica Vela, the south-eastern entrance point of Šibenički kanal, about 8 miles north-north-westward, the coast is indented and fronted by islets.

Charts 2712, 1440, 2158a.

Chart 2774, plan of Port Rogoznica.

There is a bight between a point half a mile north-westward of Rt Gradina and a point about $1\frac{1}{4}$ miles farther north-westward. Uvala Ložica lies at the head of this bight. Otočić Lukvenjak, 43 feet (13^m1) high, lies about 3 cables north-westward of the south-eastern entrance point of this bight and Otočić Šimun, 131 feet (30^m8) high and light brown in colour, lies close off the north-western entrance point, to which it is joined by a shallow bank.

Chart 2774, plan of Primošten harbour.

- 10 Luka Peleš, open westward and south-westward, is entered between Rt Zečevo, situated about a mile north-westward of Otočić Šimun, and Rt Kremik, about a mile farther north-north-westward; there are two arms at the head of this harbour. For anchorage, see page 291.

Kremik, a hill, 558 feet (170^m1) high, stands about half a mile east-
15 south-eastward of Rt Kremik.

- Luka Primošten is entered between Rt Kremik and Rt Sela, the south-western extremity of a peninsula, about half a mile north-north-eastward; the village of Primošten, in which there is a conspicuous church, and which contained 4,120 inhabitants in 1931, stands on this
20 peninsula. On the northern and north-eastern sides of Luka Primošten there are several bollards and at the village there is a mole for the local steamer. Uvala Vojske, narrow and shallow, is situated in the north-eastern part of the harbour. For anchorage, see page 291.

Chart 2774.

- 25 Otočić Smokvica, 49 feet (14^m9) high, lies close off a small peninsula which projects north-westward, about a mile northward of Rt Kremik; the islet is connected to the peninsula by a bank with depths of 4 fathoms (7^m3) over it.

- Luka Grebaštica (Grebštica) is entered between Rt Bilo, $2\frac{1}{4}$ miles
30 northward of Otočić Smokvica, and Rt Oštrica Vela, about $1\frac{1}{4}$ miles farther north-westward. Otočić Krbelica, low, bare and of a dark colour, is situated on a shallow bank which extends a short distance westward of Rt Bilo. Rt Oštrica Vela is the north-western termination of a peninsula, of which Oštrica, a hill, 308 feet (93^m9) high, about
35 a mile eastward, is the summit. The Bora here is relatively moderate, the Scirocco violent; westerly winds cause a heavy sea. The village of Grebaštica lies at the head of the inlet.

- Otočić Tmara, the western part of which is 105 feet (32^m0) high and bare, lies with its eastern end about 4 cables west-south-westward of
40 Rt Bilo; there is a passage, about 2 cables wide, between this islet and the mainland south-eastward. A rocky shoal, with a depth of $3\frac{1}{4}$ fathoms (6^m9) over it, lies close southward of the south-western extremity of Otočić Tmara (*Lat.* 43° 38' N., *Long.* 15° 54' E.).

- Luka Grebaštica can be identified by a long ancient wall on the
45 heights on its northern side. A small vessel, when approaching from southward, under favourable circumstances, may pass on either side of Otočić Tmara. For anchorage, see page 291.

- Off-lying islets.—Dangers.—Beacon.**—Otočić Svilan, 89 feet (27^m1) high, with a $2\frac{1}{4}$ -fathom (5^m0) shoal, close off its south-eastern
50 end, lies about $1\frac{1}{4}$ miles westward of Otočić Šimun.

Geben Grbavac, with a depth of less than 6 feet (1^m8) over it, lies about $1\frac{1}{4}$ miles north-north-westward of Otočić Svilan. This shoal is marked by a white beacon, 16 feet (4^m9) high, consisting of an iron staff surmounted by a framework ball below an iron flag.

Charts 1440, 2158a.

Chart 2774.

Otočić Grbavac, 108 feet (32^m9) high, lies about 3 cables north-westward of Greben Grbavac. A shoal, with a depth of 3½ fathoms (5^m9) over it, lies about 2 cables off the north-eastern side of this islet and a rocky bank, with a depth of 5½ fathoms (10^m1) over it, lies about 1½ miles south-westward of the islet. 5

Otočić Lukovnjak, 75 feet (22^m9) high, lies about 6 cables north-north-westward of Otočić Grbavac. A shallow bank extends about 1½ cables north-westward and south-eastward of this islet.

Chart 2774, plan of Primošten harbour.

Otočić Maslinovik, 121 feet (36^m9) high, lies with its north-western end about a mile east-south-eastward of Otočić Lukovnjak, and its south-eastern end, about half a mile offshore. Otočić Barilac, 46 feet (14^m0) high, lies about half a mile south-south-westward of the south-eastern end of Otočić Maslinovik. 10

A rocky shoal, with a depth of 2½ fathoms (4^m6) over it, lies in the fairway of the passage between Otočić Maslinovik and the mainland eastward, about 4 cables south-eastward of the south-eastern extremity of Otočić Maslinovik. Vessels, with local knowledge, bound to Luka Primošten from southward generally use this passage; the shoal is marked by a conical buoy, painted in red and black bands, and surmounted by a ball, and may be avoided either by keeping close to the eastern side of Otočić Maslinovik, or to the mainland coast near the entrance to Luka Peleš. 15

When bound to Luka Primošten from southward, it is prudent to pass westward and northward of all these islets and dangers. 25

Lights.—A light is exhibited, at an elevation of 33 feet (10^m1), from a white octagonal concrete tower, 26 feet (7^m9) in height, on Rt Kremik.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 16 feet (4^m9) in height, on the molehead at Primošten. (Lat. 43° 35' N., Long. 15° 55' E.). 30

Anchorage.—There is anchorage in Luka Peleš, outside the entrances to the two arms at the head of the harbour, in a depth of 16 fathoms (29^m3), sand. The two arms form good mooring places for small vessels, with hawsers to the shore; the south-eastern arm in a Bora, and the northern in a Scirocco. Boats can find shelter in the south-eastern arm from the sea caused by westerly winds, under one of the points projecting from the southern side. On entering or leaving, the 2½-fathom (4^m6) shoal, 4 cables south-eastward of Otočić Maslinovik must be avoided. 40

In Luka Primošten, large vessels can anchor south-eastward of the village church, near the middle of the harbour, in a depth of 9 fathoms (16^m5), sand; small vessels can anchor nearer the northern side or in the shallow corner northward of the mole. 45

Chart 2774.

In Luka Grebaštica, large vessels can anchor south-south-eastward of Oštrica hill, in depths of from 15 to 19 fathoms (27^m4 to 34^m7), with a hawser to the shore, if necessary; small vessels can anchor in the inner part of the harbour. 50

Charts 1581, 2774.

ZLARINSKI KANAL.—Zlarinski (Zlarin) kanal, which is about 8 cables wide in its narrowest part, is entered from south-eastward

Charts 1440, 2158a.

Charts 1581, 2774.

between Rt Oštrica Vela and Otočić Komorica, 82 feet (25^m0) high, about 2½ miles westward. Otok Zlarin, with the islets off-lying its south-eastern end, and Otok Tijat lie on the north-eastern side of the channel, and Otok Zmajan, with several islets between it and Otočić Komorica, lie on the south-western side of the channel. Zlarinski kanal is the best channel and that most frequented by vessels bound to Zadar (Zara) or to ports northward, from the neighbourhood of Rt Ploča (*Lat.* 43° 30' N., *Long.* 15° 58' E.).

- 10 The southern entrance to Šibenički kanal is situated, on the eastern side of the southern end of Zlarinski kanal, between Rt Oštrica Vela and Rt Rat, the south-eastern extremity of Otok Zlarin, about 1½ miles north-westward. Several islets lie between these two points, separated by narrow passages. Otočić Oblik, 213 feet (64^m9) high, lies about 2½ cables north-westward of Rt Oštrica Vela; a detached reef lies from one to 2 cables off the eastern side of this islet. Otočić Dvainka, 82 feet (25^m0) high, lies with its southern end about 4½ cables westward of Otočić Oblik, with Otočić Mumonja, 30 feet (9^m1) high, midway between. Otočić Drvenik, 171 feet (52^m1) high, lies with its southern end about 4 cables eastward of Rt Rat; a bank, with depths of less than 6 fathoms (11^m0) over it, extends about 2 cables from the northern end of Otočić Drvenik. See view facing this page.

- On the western side of the southern end of Zlarinski kanal, a shoal, with depths of less than 6 fathoms (11^m0) over it, extends about 1½ cables south-eastward of Otočić Komorica; on this shoal there is an above-water rock. Otočić Dugo, 79 feet (24^m1) high, lies about 8 cables west-south-westward of Otočić Komorica, with a 3½-fathom (6^m9) patch nearly midway between. Otočić Kamičac, 10 feet (3^m0) high, lies 3 cables westward of the northern extremity of Otočić Komorica. Otočić Sestrica Mala, 151 feet (46^m0) high, lies about 1½ miles north-westward of Otočić Komorica, with Otočić Vrlijača, 30 feet (9^m1) nearly midway between. Otočić Sokol, 53 feet (16^m2) high, lies about a mile westward of Otočić Sestrica Mala, and Otočić Obonjan, 203 feet (61^m9) high, with Otočić Sestrica Velika, 207 feet (63^m1) high, close eastward of its southern end, lies about 4½ cables northward of Otočić Sokol.

- On the north-eastern side of the channel, between Rt Rat and Rt Marin, the north-western extremity of Otok Zlarin, the south-western side of that island is precipitous and steep-to; Klepac, a hill near the middle of this side of the island is 558 feet (170^m1) high, its aspect from south-westward is very barren.

- On the south-western side of the channel, Otok Zmajan lies with its south-eastern extremity about 2½ cables westward of the northern end of Otočić Obonjan. Otok Zmajan, when seen from southward, has the appearance of a long hill of which the summit, towards its north-western end, is 476 feet (145^m1) high. The island is steep-to and affords no shelter except in Uvala Smetnja Vela, page 302.

- Otok Tijat lies on the north-eastern side of the channel with Rt Tijašćica, its southern extremity, about 1½ miles east-south-eastward of Rt Oštrica (Ostruška), the northern extremity of Otok Zmajan. Otok Tijat consists of several conical hills covered with woods; the summit, 397 feet (121^m0) high, stands about the middle of its north-eastern side. Luka Tijašćica, an inlet at the south-eastern end of this island, affords good shelter to small vessels in northerly winds, in

Charts 1440, 2158a.



Sveti Mihovil chapel.



Rt Red. Entrance. Otok Dugo. bearing 013° distant 6 miles. Otok Mamonja. Otok Oblak. Otok Krapanj. Otok Trava I. Old Šibenik harbour.

View in 2 parts of entrance to Šibenički kanal from southward.

(Original dated 1910.)

Charts 1581, 2774.

depths of from 3 to 9 fathoms (5^m5 to 16^m5); southerly winds cause a heavy sea. Otočić Kamenica, 26 feet (7^m9) high, about $1\frac{1}{2}$ cables eastward of Rt Tijaščica, the western entrance point of the inlet, can be passed on either side.

Danger.—Buoy.—Pličina Sestre, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies in the fairway of Zlarinski kanal, about a mile south-south-westward of Rt Marin (*Lat.* $43^\circ 42' N.$, *Long.* $15^\circ 48' E.$). A conical buoy, painted in red and black bands and surmounted by a ball, is moored on the north-eastern edge of Pličina Sestre.

Telegraph cable.—A submarine cable, indicated on the charts, which connects Otok Zlarin with Otok Žirje, about 7 miles west-south-westward, passes close southward of Otočić Sestrica Velika.

Lights.—The light on Otočić Hrbošnjak, about $4\frac{1}{2}$ miles westward of Otočić Komorica, is described on page 303.

A light is exhibited, at an elevation of 36 feet (11^m0), from a white octagonal concrete tower on a stone base, 23 feet (7^m0) in height, on Otočić Komorica.

A light is exhibited, at an elevation of 42 feet (12^m8), from a white stone tower, 19 feet (5^m8) in height, on the north-western extremity of Otočić Dvainka.

A light is exhibited, at an elevation of 42 feet (12^m8), from a cylindrical boiler, 26 feet (7^m9) in height, on Rt Tijaščica (*Lat.* $43^\circ 42' N.$, *Long.* $15^\circ 46' E.$).

Directions.—A vessel, approaching Zlarinski kanal from southward and eastward, should steer in mid-channel between Otočić Komorica and Otok Zlarin, and then between the latter and Pličina Sestre, closing the coast of Otok Zlarin to within a distance of 3 cables, and keeping that distance from it until Pličina Roženik light-structure, about three-quarters of a mile north-north-eastward of Rt Marin, bears about 031° and is well open north-westward of that point, she should then haul westward for the passage between Otok Zmajan and Otok Tijat.

APPROACHES TO ŠIBENIK.—There are three passages of approach to Šibenik, all of which lead into Šibenički (Šibenik) kanal. The southernmost is the best and most used; it is deep and lies between Otok Zlarin and the mainland south-eastward. The middle passage lies between Otok Zlarin and Otok Prvić, about $1\frac{1}{2}$ miles north-westward. The northern passage lies between Otok Prvić and the mainland north-westward.

Šibenički kanal lies between the above-mentioned islands and the mainland north-eastward.

Telegraph cables.—Beacons.—Two submarine cables, indicated on chart 1581, cross Šibenički kanal, one in the southern part from Uvala Veles to the mainland east-north-eastward and the other in the northern part, from the northern end of Otok Prvić to the mainland north-eastward. Otočić Krapanj is joined to the mainland by a submarine cable. The shore ends of these cables are each marked by a beacon.

A submarine cable, indicated on the chart, crosses the north-western part of Vodice road, page 297, from the northern end of Otok Logorun to the mainland north-north-eastward.

Anchorage is prohibited in the vicinity of the cables.

Charts 1550, 2158a.

Charts 1581, 2774.

Anchorage.—Vessels may anchor anywhere in the middle of the approach channels to Šibenik, in convenient depths and good holding ground; or, if apprehensive of a Bora, close under the mainland.

5 **Pilotage.**—The only sea pilot is generally at the entrance to the southern passage and can be summoned by three blasts on the steam whistle. Vessels frequenting the port and those of small size do not take a pilot. A harbour pilot lays the vessel alongside the quay, but accepts no responsibility.

10 **Southern end of Šibenički kanal.—Beacons.**—The entrance to the southern passage into Šibenički kanal and the principal islets with which it is encumbered, are described on page 292.

The best passage is the narrow one between Otok Zlarin, on the western side, and the islets of Dvainka and Drvenik, on the eastern
15 side. The north-eastern side of Otok Zlarin is steep, and, viewed from north-eastward, appears covered with vine and olive trees; the coast is steep to except at the northern end, where it is fringed by a narrow, shallow bank.

Otočić Krapanj, 23 feet (7^m0) high and cultivated, lies about 1½ miles
20 east-north-eastward of Otočić Drvenik and 1½ cables off the mainland north-eastward. The village of Krapanj, which is situated near the south-eastern end of the islet, contained 1,600 inhabitants, in 1931; there is a small harbour, protected by a mole, at the south-eastern end of the islet.

25 Eastward of the southern end of Otočić Krapanj, there is a narrow, tortuous and shallow passage, with cliffy sides, leading to the village of Jadrtovac, which lies on the eastern side of the passage at the southern end of Morinje, a lake, which dries.

A shoal, with a depth of less than 5 fathoms (9^m1) over it, extends
30 4 cables south-westward from Otočić Krapanj. A bank, which dries, extends about 6 cables north-westward from the islet, and depths of less than 2½ fathoms (4^m1) extend about 2 cables farther north-westward; Hrid Kraplun (Krapium) is situated near the middle of this bank, and the extremity of the bank is marked by two stone pyramidal
35 beacons, each 8 feet (2^m4) high, about half a cable apart in an east-north-east direction.

Rt Sušac (Garmina) is situated about 1½ miles north-westward of Otočić Krapanj, with Uvala Gandalj (Podslarsko) on its eastern side. A bank, with depths of less than 2 fathoms (3^m7) over it, extends
40 4 cables southward from Rt Sušac. Between Rt Sušac and a point, about 2 miles north-westward, the north-eastern side of the channel is fringed by a bank, with depths of less than 6 fathoms (11^m0) over it, about 1½ cables wide; a detached 5-fathom (9^m1) patch lies about 1½ miles north-westward of Rt Sušac and 3 cables offshore, and
45 a similar patch, with a depth of 5½ fathoms (9^m6) over it, lies about 3½ cables farther north-westward and 2 cables offshore.

Light.—A light is exhibited, at an elevation of 19 feet (5^m8) from an iron column, 17 feet (5^m2) in height, situated on the molehead in the harbour of Krapanj (*Lat.* 43° 40' N., *Long.* 15° 55' E.).

50 **Anchorage.**—Small vessels can anchor in the narrow channel between Otočić Krapanj and the mainland; they anchor nearer the islet and lay out a hawser to the shore north-eastward. The Scirocco causes only a moderate sea in this channel; the Bora blows very strongly, but the holding ground of sand and gravel is good.

Charts 1440, 2158a.

Charts 1581, 2774.

In bad weather from south-westward, which is here so common, a vessel may anchor between Otok Zlarin and the mainland, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), or proceed to one of the anchorages in Vodice road, page 297.

Chart 1581.

Middle passage into Šibenički kanal.—This passage is entered between Rt Marin, page 292, and Rt Prvić, the southern extremity of the island of that name, about 1½ miles north-westward. On the north-western side of the passage, Prvić luka, which is narrow, is entered between Rt Prvić and the south-eastern end of the island. There is a sea wall in front of the village which lies on the north-eastern side of this harbour, also numerous moles; fronting and westward of a convent on the same side, there are bollards. There are depths of 8 feet (2^m4) along the inner side of the principal mole. The village contained 1,032 inhabitants, in 1931.

Hrid Galijola (Galiola), 6 feet (1^m8) high, and bordered by a narrow shallow bank, lies about 3 cables south-eastward of Rt Prvić. Otočić Lupac, 207 feet (63^m1) high, is separated from the south-eastern end of Otok Prvić by a channel about three-quarters of a cable wide between the shallow banks extending offshore on either side; there is a depth of 5½ fathoms (9^m6) in the fairway of the channel.

On the south-eastern side of the passage, Zlarinska (Zlarin) luka is entered between Rt Marin and the northern extremity of Otok Zlarin, about a mile north-eastward. The village of Zlarin, which contained 1,250 inhabitants, in 1931, lies at the head of Zlarinska luka, where there is a small artificial harbour and a pier, with a depth of about 18 feet (5^m5) along each side for a short distance within its head. The church in the village is conspicuous.

Pličina Roženik, which dries and has a light-structure on it, lies about 5 cables west-north-westward of the northern extremity of Otok Zlarin; the northern side of Pličina Roženik is marked by a black conical buoy surmounted by a cone. Between the point and the rock there is a rocky patch, with a depth of 1½ fathoms (3^m2) over it. This patch is marked, on its northern side, by a conical buoy, painted red, and surmounted by a ball.

Lights.—A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 23 feet (7^m0) in height, on the head of the principal mole at Prvić luka.

A light is exhibited, at an elevation of 24 feet (7^m3), from an iron column, 21 feet (6^m4) in height, on the pierhead at the village of Zlarin.

A light is exhibited, at an elevation of 26 feet (7^m9), from a conical tower, 30 feet (9^m1) in height, on Pličina Roženik (*Lat.* 43° 43' N., *Long.* 15° 50' E.).

Anchorage.—Prvić luka is open to south-easterly winds only, and is otherwise well sheltered. Small vessels can anchor midway between the sides of the harbour, with a hawser laid out to the north-eastern shore; coasters moor in the innermost part of the harbour, where the sea caused by the Scirocco is moderate.

Zlarinska luka affords good shelter for medium sized vessels in a Bora, but especially in a Scirocco. The anchorage is towards the southern side, about 2½ cables from the pierhead. Small vessels, drawing less than 10 feet (3^m0), can moor in the northern part of the artificial harbour.

Charts 2774, 1440, 2158a.

Chart 1581.

There is anchorage with Pličina Roženik light-structure bearing 171°, distant about 4 cables, good holding ground.

In order to avoid the lights of a vessel being mistaken for the light on Rt Jadrija, anchorage is prohibited with that light bearing between 034° and 090°, eastward of the meridian of Pličina Roženik.

Northern end of Šibenički kanal.—Beacons.—The southern approach to the northern passage leading into Šibenički kanal is between Otok Tijat and Otok Prvić, about half a mile north-eastward, 10 *see* view on chart 1581, and the western approach is between Rt Kružić, the northern extremity of Otok Tijat, and the southern extremity of Otok Logorun, about 2 cables northward. The channels between these islands lead, through Vodice road, to the northern entrance of Šibenički kanal which lies between Rt Kronavica, the north-western 15 extremity of Otok Prvić, and the mainland, about 6 cables north-eastward.

Otok Prvić is cultivated; it is generally lower than the neighbouring islands, the summit being elevated 259 feet (78^m9). Large quantities of fish are exported.

20 The southern part of the south-western side of Otok Prvić is steep-to. Between Rt Kobila, situated about three-quarters of a mile north-westward of Rt Prvić, and Rt Kronavica, its coast is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about a cable wide; a rocky shoal, with a depth of 3½ fathoms (6^m9) over it, attached 25 to this bank, lies about 1½ cables north-westward of Rt Kobila and the same distance off the coast north-eastward.

The village of Šepurine, which contained 1,413 inhabitants, in 1931, and where there is a boat cove and a small pier, is situated about 3½ cables north-westward of Rt Kobila.

30 Shallow banks extend from the northern end of Otok Tijat and the southern end of Otok Logorun, narrowing the passage between them to a width of about 1½ cables.

Otok Logorun, which is covered with bushes, is 161 feet (49^m1) high near its northern end, and is connected to the mainland, about 35 2½ cables northward, by a shallow bank. Otočić Lukovnik, 102 feet (31^m1) high, lies on this bank close north-westward of Otok Logorun.

The town of Tribunj, which contained 1,200 inhabitants in 1931, stands on a rocky projection, connected to the mainland by a stone bridge, about a cable north-eastward of Otočić Lukovnik; the church 40 of Sveti Nikola, on a hill, 167 feet (50^m9) high, overlooking the town, is conspicuous.

The coast between Tribunj and the village of Vodice, about 1½ miles eastward, is bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, about 1½ cables wide. There is a small artificial harbour 45 at Vodice, formed by two moles. Sveti Križ church stands on a projection close south-westward of the village, which contained 3,018 inhabitants, in 1931. A detached shoal, with a depth of 4½ fathoms (8^m7) over it, lies about 2½ cables southward of this projection.

In the shallow bight on the eastern side of Vodice, a rock, with 50 a depth of 3 feet (0^m9) over it, is situated about 1½ cables eastward of the southern molehead of the harbour; this rock is marked, on its south-western side, by a black and red iron beacon, 16 feet (4^m9) high, surmounted by a ball (*Lat.* 43° 45' N., *Long.* 15° 47' E.). A spit, with depths of less than 3 fathoms (5^m5) over it, extends 1½ cables south-

Charts 2774, 1440, 2158a.

Chart 1581.

eastward of the beacon. Vodice light is obscured over the rock and the greater part of this spit.

The area between Otok Logorun and the mainland eastward is known as Vodice road, for anchorage, *see* below.

Between a point about 3 cables eastward of the head of the southern mole at Vodice and Rt Jadrija (Jadria), about $3\frac{1}{2}$ miles south-eastward, the coast of the mainland is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which gradually increases in width from about one cable at its north-western end to half a mile off Rt Jadrija, where its outer part extends about a quarter of a mile farther in a south-easterly direction in the form of a broad spit. Pličina Srma, with a depth of 3 feet (0^m9) over it, extends 2 cables offshore, about $1\frac{1}{2}$ miles north-westward of Rt Jadrija. The south-western edge of Pličina Srma is marked by an iron beacon, 10 feet (3^m0) high, surmounted by a ball. Vodice light is obscured over this shoal.

On the south-western side of the northern part of Šibenički kanal, the coast of Otok Prvić is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as 2 cables wide in places.

Lights.—A light is exhibited, at an elevation of 18 feet (5^m5), 20 from an iron column, 23 feet (7^m0) in height, on the pierhead at Šepurine (*Lat.* $43^\circ 44' N.$, *Long.* $15^\circ 47' E.$).

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 18 feet (5^m5) in height, at Tribunj.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 18 feet (5^m5) in height, on the southern molehead at Vodice.

Anchorage.—Vessels can anchor off the village of Šepurine, in a depth of about 12 fathoms (21^m9), sand.

The anchorage in Vodice road, one of the best off this coast, is in a depth of 8 or 9 fathoms (14^m6 or 16^m5), sand, about midway between the village of Vodice and Rt Kronavica. Vessels of shallow draught can anchor near the village, eastward of the projecting point westward of it, at a distance of at least 2 cables from the shore, nearer which the bottom is rocky. Vessels drawing up to 8 feet (2^m4) can secure to the moles in the artificial harbour.

There is also anchorage farther westward, in a depth of 7 fathoms (12^m8), about 3 cables off Otok Logorun; the $4\frac{1}{2}$ -fathom (8^m7) shoal, situated southward of the projection on which Sveti Križ stands, previously mentioned, lies nearly midway between these two anchorages. Both anchorages are exposed to the Scirocco, which causes a considerable sea, especially in the western part of the road. In a Bora, which here can blow furiously in winter, the anchorage off Šepurine is to be preferred to that off Vodice.

Chart 2774.

Directions.—The navigation of the southern end of Šibenički kanal presents no difficulty.

Chart 1581.

A vessel using the middle passage, should pass between Otočić Lupac and Pličina Roženik, giving the latter a berth of about $1\frac{1}{2}$ cables.

A vessel of deep draught, if proceeding into Kanal Sveti Ante, should steer south-eastward from a position about 4 cables north-eastward of Pličina Roženik, until the northern extremity of Sveti Nikola fort bears about 022° and is open south-eastward of the light-tower on Hrid Ročni, when she may steer for the northern extremity of Sveti

Charts 2774, 1440, 2158a.

Chart 1581.

Nikola fort, bearing 022° and alter course for the entrance when the light-tower on Rt Jadrija bears 003°.

- A vessel approaching by the northern passage must pass through
 5 Vodice road and steer a mid-channel course between Otok Prvič and the mainland, passing 4 cables north-eastward of Pličina Roženik, whence she should steer as directed above.

- Kanal Sveti Ante.**—Kanal Sveti Ante (Antuna) leads into the harbour of Šibenik ; it lies between rocky cliffs and is tortuous ; the
 10 narrowest part, at its eastern end, is three-quarters of a cable wide. The channel is entered, from westward, between Rt Jadrija and Hrid Ročni, about a cable south-eastward. Hrid Ročni is the northernmost of a group of above-water rocks which lie on the north-western extremity of a shallow bank which extends about 3 cables north-westward
 15 from the mainland. Sveti Nikola fort (*Lat. 43° 43' N., Long. 15° 51' E.*), which has a line of embrasures near the water's edge, is situated at the northern end of an islet, on the southern side of the channel, about a cable north-eastward of Hrid Ročni. Between the islet just mentioned and Senišna rt, about 2 cables east-north-
 20 eastward, there is a bight. A shoal extends nearly half a cable off Senišna rt.

- On the northern side of the channel, there is a bight between Rt Jadrija and Rt Rat, 2 cables north-north-eastward ; a shoal extends nearly half a cable off Rt Rat. Debeli rt lies about a cable east-
 25 north-eastward of Rt Rat.

- Rt Sveti Ante lies, on the southern side of the channel, about half a mile east-north-eastward of Senišna rt, and Rt Sveti Križ lies on the northern side, about 3 cables farther east-north-eastward. Rt Turan lies on the northern side of the eastern entrance, about a cable
 30 east-north-eastward of Rt Sveti Križ.

Pličina Paklena extends about 1½ cables offshore, about 1½ cables eastward of the south-eastern entrance point of the channel. See view facing this page.

- A vessel proceeding through the channel, should keep in mid-
 35 channel, avoiding the shoals extending about half a cable from Rt Rat and Senišna rt. At the eastern end of the channel, Rt Turan should be kept aboard.

- There is a constant west-going current through the channel, the rate of which is greatest along the northern side. Outside the eastern
 40 entrance, off Rt Turan, the current is south-east-going ; the rate of this current, in summer, is about half a knot and, in winter, may attain a rate of 3 knots.

Vessels must not clean or stoke fires, nor use forced draught within a radius of 2½ cables of Sveti Nikola fort.

- 45 **Telegraph cable.**—A submarine cable, indicated on the chart, crosses Kanal Sveti Ante near its eastern end.

Lights.—**Fog signal.**—A light is exhibited, at an elevation of 26 feet (7^m9), from an octagonal tower and dwelling, 28 feet (8^m5), in height, on Rat Jadrija.

- 50 A light is exhibited, at an elevation of 21 feet (6^m4), from a circular tower on a concrete base, 22 feet (6^m7) in height, on Hrid Ročni.

A light is exhibited, at an elevation of 43 feet (13^m1), from a lantern on Sveti Nikola fort.

A fog signal is sounded from Sveti Nikola fort.

Charts 2774, 1440, 2158a.

Mt. Goudenovac.



*Rt Jadrija
lighthouse.*

*Sveti Nikola fort.
Beacon. Hrid Ročni.*

Šibenik.

Entrance to Kanal Sveti Ante, Šibenik.

(Original dated 1910.)

Chart 1581.

A light is exhibited, at an elevation of 21 feet (6^m4), from a circular hut, 30 feet (9^m1) in height, on Debeli rt.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column, 23 feet (7^m0) in height, on Senišna rt.

A light is exhibited, at an elevation of 30 feet (9^m1), from a circular tower, 23 feet (7^m0) in height, on Rt Sveti Ante.

A light is exhibited, at an elevation of 30 feet (9^m1), from a metal column, 23 feet (7^m0) in height, on Rt Sveti Križ.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column on a stone base, 23 feet (7^m0) in height, on the north-eastern edge of Pličina Paklena.

Traffic regulations.—The limits of Kanal Sveti Ante are defined by lines joining Rt Jadrija and Hrid Ročni light-column, westward, and Rt Turan and Pličina Paklena light-column, eastward.

Vessels passing through Kanal Sveti Ante are to proceed at a speed not exceeding 5 knots, in order to avoid damaging and endangering small craft.

Traffic through the channel is regulated by signals shown from Sveta Ana fort, in Šibenik, and Sveti Nikola fort, those from the former station relating to out-going vessels, and those from the latter to in-coming.

Two black balls, placed vertically, by day, or two *green* lights, placed vertically, at night, indicate that the channel is clear.

A red cone, apex upwards, by day, or two *red* lights, placed vertically, at night, indicate that the channel is not clear.

Steam vessels of 200 tons gross tonnage and upwards, and sailing vessels of 100 tons and upwards, together with vessels in tow, when the length from the bow of the tug to the stern of the vessel towed exceeds 328 feet (100^m0), if desirous of passing through the channel, must hoist by day flag H of the International Code of Signals, or at night exhibit two lights, placed vertically, the upper *white* and the lower *red*, such signals to be made by out-going vessels immediately before getting under way, and by in-coming vessels from 5 to 10 minutes before arriving at the entrance to the channel.

If the signal station makes the "not clear" signal, or if no signal is made, vessels are to wait until the "channel clear" signal has been made.

Šibenik.—Harbour.—Telegraph cable.—The harbour of Šibenik is a narrow basin surrounded by high land and bordered by a rocky shore. The town of Šibenik stands on the eastern side of the harbour, facing Kanal Sveti Ante. At the south-eastern end of the harbour there are two arms separated by the peninsula of Mandalina, which terminates in Kulina point (*Lat. 43° 43' N., Long. 15° 54' E.*). Sveti Petar (Supetar) bay, with the church of Sveti Petar on the north-eastern side of its head, lies south-westward of the peninsula, and Fornasa cove, on the north-eastern side. There are several quays and jetties on the shores of the bays and coves in the south-eastern end of the harbour; there is also a coaling wharf with two jetties, each with a depth of 13 feet (4^m0) at its head, whence the depths increase rapidly.

The southern end of Šibenik is fronted by Makale quay; Krka mole, which had an obstruction off its head, in 1944, is situated near the north-western end of this quay. A new mole projects west-south-westward from the shore, about 3 cables south-eastward of Krka mole;

Chart 1581.

it was reported, in 1944, that vessels could not be accommodated at the new mole. There are a number of mooring buoys in the harbour.

The north-western part of the harbour of Šibenik is known as Krka inlet.

A submarine cable, indicated on the chart, crosses Krka inlet about a mile north-westward of Krka mole.

A church, with a dome surmounted by a small cross, about $1\frac{1}{2}$ cables north-north-westward of Krka mole; a house at Sveti Martin, $6\frac{1}{2}$ cables west-north-westward of Krka mole; and the radio station and mast at the head of Fornasa cove, are conspicuous.

Dangers.—A rock, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over it, lies about $1\frac{1}{2}$ cables north-north-eastward of Kulina point and $1\frac{1}{2}$ cables offshore.

15 A patch of foul rocky ground, with a depth of 9 fathoms (16^m5) over it, is situated about a cable south-westward of the southern head of the new mole.

Anchorage.—Vessels can anchor where convenient between imaginary lines drawn north-westward and south-westward from the head of Krka mole. There is a berth with the head of that mole, bearing 060° , distant $1\frac{1}{2}$ cables, in a depth of 18 or 19 fathoms (32^m9 to 34^m7). Small vessels can moor alongside the quays. There is good shelter in Sveti Petar bay, in depths of from 10 to 12 fathoms (18^m3 to 21^m9), mud.

25 The depths of Krka inlet are considerably greater than those in the south-eastern portion of the harbour.

The Bora is severely felt here, but this is a good commodious anchorage.

Vessels must be careful to avoid anchoring on the rocky patches, previously mentioned, or in the vicinity of the telegraph cable in Krka inlet.

Town.—Port facilities.—Šibenik is built in the form of an amphitheatre, and is situated at the base of Titar (Tartaro) a mountain (chart 2774), which rises to an elevation of 1,640 feet (499^m9), about $3\frac{1}{2}$ miles inland.

The town contained 17,122 inhabitants in 1931. There is a railway along the quay fronting the town. The quay for large vessels is 328 yards (299^m9) long, and near it, there is a lower quay for small vessels.

40 There is a hospital in the town.

Provisions can be procured. Water is laid on to the town quay. Time signals are made from Sveta Ana fort (*Lat.* $43^\circ 44' N.$, *Long.* $15^\circ 53' E.$).

A tug is available.

45 **Communications.**—Šibenik is connected to the general railway system. There is frequent steamer communication with Ancona, Trieste and Fiume. There is a radio station, *see* page 46.

Meteorology.—*See* tables, page 29, and Local winds, page 15.

Chart 2774.

50 **Reka Krka.**—The mouth of this river is situated about $3\frac{1}{2}$ miles north-westward of Krka mole, about a mile from the head of Krka inlet. A sunken rock, with a depth of less than 6 feet (1^m8) over it, lies close off Rt Triska, the southern entrance point.

About midway between its mouth and the village of Skradin, $4\frac{1}{2}$ miles

Charts 2774, 1440, 2158a.

Chart 2774.

north-eastward, this river flows through Prokljansko (Prokljan) jezero. About 2 miles above Skradin, close to the village of Krka, there is a waterfall.

Reka Krka is navigable by small vessels, with local knowledge, up to the foot of the waterfall; between Prokljansko jezero and Skradin the river bed narrows to about half a cable in places. The least depth in this part is 4 fathoms (7^m3). At Skradin, there is a bar across the river, with depths of from 1½ to 2½ fathoms (2^m7 to 5^m0) over it.

There are some mooring buoys off Skradin.

The passage from Skradin to the Krka falls is easily accomplished by boats. A bridge spans the river 4½ cables above Skradin. Above the bridge, the channel, which has been dredged, is wide and deep, until one cable below the falls, where it is foul with boulders. The nearest landing place to the falls is at a landing stage with a depth of 10 feet (3^m0) alongside, situated a quarter of a mile below the falls on the south-western side of the river.

Prokljansko jezero.—Beacon.—The shores of this lake are mostly bordered by a shallow bank on which there are reefs in places, and in the northern part of the lake there are two detached reefs. The water of the lake is brackish.

Between the outlet of the lake, in its south-western corner, and where Reka Krka enters it, about 1½ miles north-eastward, there are no dangers, but off Rt Smokvica, on the northern side of the river entrance, at the edge of the shore bank, there is a shoal with a depth of 1½ fathoms (3^m2) over it; this shoal is marked by an iron pole beacon, 16 feet (4^m9) high.

Good anchorage, in a depth of 9 fathoms (16^m5), mud, was obtained, in 1930, by H.M.S. *Bryony*, in a position 3 cables west-north-westward of Rt Oštrica, the southern point of the river entrance just mentioned, situated about half a mile southward of Rt Smokvica.

OFF-LYING ISLANDS.—Otok Kaprije lies with Rt Lemeš, its south-eastern extremity, about 3 miles west-north-westward of Otočić Sokol (*Lat.* 43° 40' N., *Long.* 15° 47' E.), page 292, and is separated from Otok Zmajan by Kapriski kanal. Otok Kaprije consists of barren hills, with a little cultivation in the hollows between them; the summit, 433 feet (132^m0) high, is situated near the southern end of the island.

Kapriski kanal.—Islets and dangers.—This channel is rendered intricate by islets and shoals, among which the current sets with considerable velocity; notwithstanding which it may be used, in daylight, by a vessel of any size. The channel is entered from south-eastward between Otočić Sokol and the eastern of the two Otočići Mišjaci, about a mile westward; the eastern of these two islets is 151 feet (46^m0) high and the western is 213 feet (64^m9) high; the latter is situated midway between the eastern islet and Rt Lemeš, with Otočić Gumanac, 10 feet (3^m0) high, about 2 cables north-westward of its western end. A bank, with a least depth of 2½ fathoms (4^m1) over it, extends about 2 cables north-westward of Otočić Gumanac.

Otočić Kraljak, 72 feet (21^m9) high, lies about 4 cables north-north-eastward of Otočić Gumanac. Pličina Kraljak, with a least depth of 1½ fathoms (3^m2) over it, lies from 2 to 5 cables south-eastward of Otočić Kraljak.

Charts 2774, 1440, 2158a.

Chart 2774.

On the north-eastern side of Kapriski kanal, Uvala Smetnja Vela is entered between Rt Sira, the southern extremity of Otok Zmajan, and Rt Smetnja, about three-quarters of a mile north-westward; a spit, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over it, extends about $3\frac{1}{2}$ cables south-eastward from Rt Smetnja with Otočić Galebinjak, 13 feet (4^m0) high, on its outer end. This bay affords shelter, in a depth of 6 fathoms (11^m0), sand.

On the south-western side of the channel, there is anchorage for small vessels in Uvala Gačice, which is entered between Rt Mrtovac, situated about $1\frac{1}{2}$ miles north-north-eastward of Rt Lemeš, and Otočić Oštrica, lying close off the coast of Otok Kaprije, about half a mile north-westward.

Otočić Bavljenac (Banjevac), 144 feet (43^m9) high, lies about $6\frac{1}{2}$ cables south-westward of Rt Oštrica, the northern extremity of Otok Zmajan; a detached shoal, with a depth of 4 fathoms (7^m3) over it, lies about half a mile northward of Otočić Bavljenac (*Lat.* $43^\circ 42' N.$, *Long.* $15^\circ 44' E.$).

The southern of the two Otočići Dupinić, 39 feet (11^m9) high, lies about a quarter of a mile west-north-westward of Otočić Bavljenac and 3 cables off the north-eastern side of Otok Kaprije; the northern of these two islets is 29 feet (8^m8) high and lies about 2 cables north-north-westward of the southern islet.

Otočić Prčevac (Perčevac), 115 feet (35^m0) high, lies about 2 cables northward of Rt Medoš, the north-eastern extremity of Otok Kaprije.

Telegraph cable.—A submarine cable, indicated on the chart, is laid across the northern end of Kapriski kanal between Otok Kaprije and Otok Logorun, north-eastward; anchorage is prohibited in the vicinity of this cable.

Directions.—A vessel from south-eastward should pass south-westward of Otočić Dugo and Otočić Sokol, and eastward of Otočići Mišnjaci; whence Otočić Prčevac in line with the southern end of Otočići Dupinić, bearing 313° , leads through the narrow portion of the channel, north-eastward of Pličina Kraljak. When approaching Otočić Bavljenac, three clear passages are available for leaving the channel, but that between Otočić Bavljenac, on the eastern side, and Otočići Dupinić, on the western side, is the widest; care must be taken to avoid the 4-fathom (7^m3) shoal, half a mile northward of Otočić Bavljenac.

Otok Kakan.—This island, consisting of barren hillocks with partly cultivated spaces between, lies with Rt Kakna, its south-eastern extremity, about $1\frac{1}{2}$ miles west-north-westward of Rt Lemeš, and is separated from Otok Kaprije by Kakanski kanal, which is only about $1\frac{1}{2}$ cables wide in its narrowest part. The island is 367 feet (111^m9) high at its south-eastern end. *See view facing page 305.*

Kakanski kanal.—**South-eastern approach.**—**Danger.**—Several islets lie in the south-eastern approach to Kakanski kanal, of which Otočić Hrbošnjak, 72 feet (21^m9) high, about $2\frac{1}{2}$ miles from Rt Kakna, is the south-easternmost. Otočić Ravan (Ravna), 66 feet (20^m1) high, lies about 7 cables northward of Otočić Hrbošnjak. Otočić Ravna Sika lies close off the eastern end of Otočić Ravan, and Otočić Politrelica, 13 feet (4^m0) high, lies 2 cables north-westward of the western end of the same islet. Otočić Kamešnjak (Kamenišnjak) Veliki, 66 feet (20^m1) high, lies about 2 cables southward of Rt Kakna and

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Chart 2774.

Otočić Kamešnjak Mali, 56 feet (17^m1) high, lies about 2 cables eastward of the larger islet. A shoal, with a depth of 1½ fathoms (2^m7) over it, lies about 2½ cables south-eastward of Otočić Kamešnjak Mali.

Light.—A light is exhibited, at an elevation of 81 feet (24^m7), from a red iron framework structure, 27 feet (8^m2) in height, on Otočić Hrbošnjak (*Lat.* 43° 39' N., *Long.* 15° 44' E.).

Channel.—Islets and danger.—Kakanski kanal, which forms the shortest route between Rt Ploča and Zadar, and can be used, in daylight, by a vessel of any size, is entered between the two Otočići Kamešnjak. On the north-eastern side, Luka Kaprije lies close within the narrowest part of the channel; there is a depth of 8 fathoms (14^m6) in the entrance to this inlet, whence the depths decrease gradually towards its head. This harbour affords shelter to vessels 82 feet (25^m0) long, drawing 10 feet (3^m0), being open only north-westward. 15 The small village of Kaprije is situated on the north-eastern side of the inlet, where there is a pier.

On the south-western side of the channel, Rt Oštrica lies about 1½ miles north-westward of Rt Kakna; a shoal, with a depth of 3 fathoms (5^m5) over it, lies nearly in mid-channel, about 2 cables east-north-eastward of Rt Oštrica. Uvala Potkućina lies between Rt Oštrica and a point, about three-quarters of a mile north-westward. Two islets which are cultivated, lie in the northern approach to this bay; the north-western islet, Otočić Brnjak Veliki, 95 feet (29^m0) high, is connected to the north-western entrance point by a narrow bank, with a depth of 2 fathoms (3^m7) over it, and Otočić Brnjak Mali, 105 feet (32^m0) high, is connected to the south-eastern side of the north-western islet by a narrow bank, with a depth of 3½ fathoms (6^m4) over it. There is anchorage for small vessels in Uvala Potkućina, in a depth of 9 fathoms (16^m5), well protected by the islets northward and by Otok Kaprije from easterly or south-easterly winds; there is also anchorage for small vessels in Uvala Nadprisliga, close north-westward of Uvala Potkućina, off the western side of Otočić Brnjak Veliki, in a depth of about 8 fathoms (14^m6).

On the north-eastern side of the channel, between Rt Remetić, situated about 6 cables north-north-eastward of Rt Oštrica, and Rt Kaprije, about a mile north-westward, there are two small bays. There is anchorage for small vessels in Uvala Vanjska, the south-eastern of these two bays.

Current.—The current through Kakanski kanal is rapid.

North-western approach to Kakanski kanal.—Islets and dangers.—A number of islets and shoals lie on the south-western side of the north-western approach to Kakanski kanal. Hrid Mala Mare, 10 feet (3^m0) high, lies about a quarter of a mile north-north-westward of Rt Kakna (Kakan), the north-western extremity of Otok Kakan; and a shoal, with a depth of 5½ fathoms (10^m5) over it, lies about 4 cables westward of the same point.

Otočić Dužac, 46 feet (14^m0) high, lies with its south-eastern end about three-quarters of a mile north-westward of Hrid Mala Mare. A detached shoal, with a depth of 2½ fathoms (4^m1) over it, lies about 6 cables east-north-eastward of the south-eastern end of Otočić Dužac. Otočić Čerigul, 26 feet (7^m9) high, is connected to the north-western end of Otočić Dužac by a narrow bank, with a depth of 3½ fathoms (6^m9) over it.

Charts 1440, 2158a.

Chart 2774.

Otočić Tetevišnjak Mali, 102 feet (31^m1) high, with Hrid Kablinac, 13 feet (4^m0) high, close off its south-eastern end, lies about 6 cables south-westward of Otočić Dužac; and Otočić Tetevišnjak Veliki, 236 feet (71^m9) high, lies about 2 cables farther north-westward. A shoal, with a depth of 2½ fathoms (5^m0) over it, lies about 1½ cables off the northern side of Otočić Tetevišnjak Veliki.

Otočić Čavlin, 108 feet (32^m9) high, lies about 6 cables north-westward of Otočić Tetevišnjak Veliki, with a 3-fathom (5^m5) patch close off its western side. Plićak Čavlin, a shoal with a depth of one fathom (1^m8) over it, lies about a mile west-north-westward, and another shoal, with a depth of 3½ fathoms (5^m9) over it, lies about three-quarters of a mile west-south-westward, of Otočić Čavlin. A shoal, with a depth of 3½ fathoms (5^m9) over it, lies about 6 cables northward, and another shoal, with a depth of 5½ fathoms (10^m5) over it, lies about 4 cables north-north-eastward, of the same islet.

Directions.—A vessel approaching from south-eastward should pass between Otočić Hrbošnjak, on the southern side, and Otočić Ravan, on the northern side, and steer for the south-western end of Otočić Kamešnjak Veliki, then between the two Otočići Kamešnjak and through the middle of the narrows. When through the narrows, she should steer along the coast of Otok Kaprije, which is steep-to, at a distance of about a cable to avoid the 3-fathom (5^m5) patch off Rt Oštrica. When abreast Rt Remetić she should steer for Raduč, the summit of Otok Murter, bearing about 329°, passing eastward of the 2½-fathom (4^m1) shoal lying eastward of Otočić Dužac (*Lat.* 43° 43' N., *Long.* 15° 37' E.).

Otok Žirje.—This is the outermost of the islands lying west-south-westward of Šibenik and consists of two parallel ranges of hills, united by a cultivated plain; Kapić, the summit, is 430 feet (131^m1) high. Seen at a distance from south-eastward, the island appears as two. From southward the island appears covered with trees and bushes; from northward it is generally rocky and of whitish aspect. The village of Žirje is situated on the central plain in the north-western part of the island, and contained 900 inhabitants, in 1931.

Otok Žirje lies with its south-eastern extremity about a mile south-south-westward of Otočić Hrbošnjak and is separated from Otok Kakan and the southern part of Otok Kaprije by Žirjevski (Žirje) kanal, which is about a mile wide in its narrowest part.

Žirjevski kanal.—**Islets and dangers.**—**Beacon.**—Žirjevski kanal is entered from south-eastward between Otočić Ravan and Otočić Mažirina, 184 feet (56^m1) high, situated 2 cables off the south-eastern end of Otok Žirje, about 1½ miles southward. Otočić Hrbošnjak (*Lat.* 43° 39' N., *Long.* 15° 44' E.), page 302, lies in the middle of the entrance.

The south-western side of the channel, between the south-eastern extremity of Otok Žirje and Rt Muna, 3½ miles west-north-westward, is exposed to the Bora. Otočić Gušteranski, 92 feet (28^m0) high, lies about a mile westward of Otočić Hrbošnjak and 3½ cables off the coast of Otok Žirje; a bank, with a depth of 5½ fathoms (9^m6) at its outer end, extends about 1½ cables northward and also a short distance southward of this islet. Otočić Koromašna, 39 feet (11^m9) high, lies about 1½ miles west-north-westward of Otočić Gušteranski and 3½ cables offshore.

Kremik summit.

*Otočić
Tedenšnjak.*

Hrid Mala Mare.

*Otok
Kakan.*

*Otočić
Hrbošnjak.*

*Brak od
Prašića.*

*Otočić
Mikavica.*

Žirjevski kanal.—Leading mark, Kremik summit in line with Otočić Hrbošnjak,
bearing 118°.

(Original dated 1910.)

Chart 2774.

Uvala Muna, open north-westward, is situated close south-westward of Rt Muna, with the village of the same name at its head; small vessels can anchor off the village in depths of from 14 to 17 fathoms (25^m6 to 31^m1), sand and weed, and secure to the shore. There is a mole in the cove inside which boats can find shelter. This cove may be identified by some large store-houses on its shores.

On the north-eastern side of Žirjevski kanal, a shoal, with a depth of 2½ fathoms (4^m6) over it, lies about a mile west-north-westward of the south-eastern extremity of Otok Kakan and 1½ cables off the coast of that island.

On the south-western side of the channel, Brak od Prašćića, a rock with a depth of less than 6 feet (1^m8) over it, lies about three-quarters of a mile north-westward of Rt Muna and 3 cables offshore; it is marked, on its northern side, by an iron pole beacon, 16 feet (4^m9) high, 15 surmounted by a ball.

Otočić Mikavica, 13 feet (4^m0) high, lies about 6 cables eastward of Rt Žirja, the north-western extremity of Otok Žirje; a bank, with a depth of 1½ fathoms (2^m7) over it, extends about 1½ cables south-eastward of this islet. In southerly winds, small vessels, with local knowledge, occasionally anchor in Uvala Mikavica, situated half a mile south-eastward of the islet of that name. There are two jetties on the south-western side of the head of this cove; vessels, drawing up to 8 feet (2^m4) can secure, head on, to the outer jetty.

A rocky shoal, with a depth of 3½ fathoms (6^m9) over it, lies about 3½ cables north-north-eastward of Rt Žirja and Otočić Raparašnjak, 52 feet (15^m8) high, lies about 6 cables west-north-westward of the same point.

The islets and dangers lying on the north-eastern side of the channel in the north-western approach to Kakanski kanal are described on page 303.

On the south-western side of the north-western approach to Žirjevski kanal, Otočić Samograd, 108 feet (32^m9) high, lies about 1½ miles west-north-westward of Otočić Raparašnjak and Otočić Vrtlić, 30 feet (9^m1) high, lies about half a mile farther west-north-westward. Otočić Mrtovnjak (Mertovnjak), 134 feet (40^m8) high, lies about a mile north-westward of Otočić Vrtlić; a shoal, with a depth of 4½ fathoms (7^m8) over it, lies about 4½ cables off the south-eastern side of Otočić Mrtovnjak. The islets lying farther north-westward are described on page 339. See view on chart 2774.

Telegraph cable.—A submarine cable between Otok Žirje and Otok Zlarin, indicated on the chart, crosses Žirjevski kanal, passing southward of Otočić Ravan.

Directions.—A vessel proceeding north-westward through Žirjevski kanal, after passing Otočić Hrbošnjak, should keep that islet in line with Kremik, page 290, bearing 118°. See view facing this page.

South-western side of Otok Žirje.—Hrid i Rt Rasog (Lat. 43° 38' N., Long. 15° 44' E.) lies about 1½ cables south-eastward of the south-eastern extremity of Otok Žirje. This rock is covered at high water and breaks in a heavy sea; it should be given a berth of over 2 cables. Uvala Stupica Mala and Uvala Stupica Vela, separated by a peninsula, are entered between Rt Kabal, about three-quarters of a mile westward of the south-eastern extremity of Otok Žirje, and

Chart 2774.

Rt Grašnjak, about three-quarters of a mile farther westward. A shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, extends a short distance off the peninsula separating these two bays, and a shoal, with a depth of $4\frac{1}{2}$ fathoms (8^m2) over it, lies about $1\frac{1}{2}$ cables south-eastward of Rt Grašnjak. Otočić Bavkul, 20 feet (6^m1) high, lies about 4 cables southward of Rt Kabal (*Lat.* $43^\circ 38' N.$, *Long.* $15^\circ 43' E.$).

Uvala Stupica Mala, the eastern bay affords, in all winds, the best shelter on this side of Otok Žirje; there are rocks ashore to which 10 vessels can secure. There is anchorage for small vessels in Uvala Stupica Vela, in depths of from 20 to 25 fathoms (36^m6 to 45^m7), sand, sheltered from all except southerly winds, which latter cause a heavy sea. Within a depth of 7 fathoms (12^m8), the bottom of this bay is rocky.

15 Otočić Škrvada, 23 feet (7^m0) high, lies about a quarter of a mile south-westward of Rt Grašnjak and 2 cables off the coast to which it is connected by a bank, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it. A shoal, with a depth of $8\frac{1}{2}$ fathoms (11^m4) over it, lies about 3 cables west-north-westward of Otočić Škrvada.

20 Between Rt Grašnjak and Tratinski rt, about $3\frac{1}{2}$ miles north-westward, there are several coves none of which can be recommended as an anchorage. Rt Ljuta lies about a mile west-north-westward of Tratinski rt; a shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, extends a short distance off Rt Ljuta. Between the latter point and Rt Žirja, 25 three-quarters of a mile north-north-westward, there are two coves separated by Rt Sridan. It is possible for small vessels to anchor in these coves during a Bora or southerly winds in case of emergency, but the holding ground is bad.

Otočić Nozdra, 26 feet (7^m9) high, lies about 4 cables west-south-30 westward of Rt Sridan.

Off-lying islets and dangers.—A group of islets, rocks, and shoals lies off the middle of the south-western side of Otok Žirje. Otočić Blitvenica, the outermost of this group, is 98 feet (29^m9) high and lies about $3\frac{1}{2}$ miles south-south-westward of Rt Žirja. Otočić 35 Ravna, 52 feet (15^m9) high, lies about $1\frac{1}{2}$ miles eastward of Otočić Blitvenica, with Otočić Kameni, 36 feet (11^m0) high, about a cable farther east-south-eastward, connected to Otočić Ravna by a bank, with a depth of 8 fathoms (14^m6) over it. A shoal, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies close south-westward of Otočić Ravna, and 40 Pličina Grmeni, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, lies 4 cables east-south-eastward of Otočić Kameni; a detached shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m5) over it, lies about $1\frac{1}{2}$ miles south-eastward of the same islet.

Otočić Kosmrka (Balkun), 82 feet (25^m0) high, the northernmost of 45 this group, lies about $1\frac{1}{2}$ miles east-north-eastward of Otočić Blitvenica, with Otočić Proklandica (Kosmerka), 26 feet (7^m9) high, connected to the former by a bank, with a depth of 8 fathoms (14^m6) over it, a short distance farther east-south-eastward. Hrid Balkun, 20 feet (6^m1) high, lies about one cable south-westward of Otočić Kosmrka, 50 and a shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, lies about $1\frac{1}{2}$ cables south-south-westward of the same islet.

Otočić Sedlo, 49 feet (14^m9) high, the south-easternmost of the islets lying off Otočić Kurba Vela, page 353, lies about $2\frac{1}{2}$ miles south-westward of Rt Žirja, with Greben Pjat, with a depth of less than

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Chart 2774.

6 feet (1^m8) over it, about half a mile north-westward of it. A 5-fathom (9^m1) patch lies about 4 cables south-eastward of Otočić Sedlo. Hrid Bačvica, 3 feet (0^m9) high, lies nearly midway between Otočić Sedlo and Otočić Samograd, page 305. See view on chart 2774.

Light.—A light is exhibited, at an elevation of 125 feet (38^m1), from an octagonal stone tower on a circular base, near a dwelling, 71 feet (21^m6) in height, on Otočić Blitvenica (Lat. 43° 38' N., Long. 15° 35' E.). See view.

*Otočić Blitvenica lighthouse.*

Directions.—A vessel proceeding to the north-western end of Žirjevski kanal from the vicinity of Otočić Blitvenica, after passing 15 that islet, should steer northward between Otočić Sedlo, Hrid Bačvica and Otočić Samograd, on the western side, and Otočić Nozdra and Otočić Raparašnjak, on the eastern side.

COAST.—The mainland coast from Tribunj, page 296, trends 2½ miles west-north-westward to Rt Obinuš Veli, the south-eastern 20 entrance point of Murterski (Murter) kanal. A detached bank, with a least depth of 6 feet (1^m8) over it, lies midway between the entrance points of the bight between Tribunj and a point about three-quarters of a mile north-westward; Uvala Sovlje lies close westward of the latter point. Otočić Prišnjak lies about three-quarters of a mile 25 west-south-westward of Tribunj and 4 cables offshore. Otočić Sovljak, 59 feet (18^m0) high, lies in the approach to Uvala Sovlje, about 3 cables north-north-westward of Otočić Prišnjak. There is good anchorage for small vessels, with local knowledge, during a Bora, in Uvala Sovlje.

Chart 1581, plan of Murter bay.

30

MURTERSKI KANAL.—Islets and dangers in southern approach.—**Beacon.**—Murterski kanal is entered from southward between Rt Obinuš Veli and Rt Rat, the south-eastern extremity of Otok Murter, about 1½ miles westward. Otok Murter, forming the south-western side of the channel, is connected to the mainland by 35 a swing bridge, about 2½ miles north-westward of this entrance. Rt Obinuš Veli is the extremity of a tongue of land, 92 feet (28^m0) high, which projects south-westward and has a chapel on its end.

The south-eastern end of the channel is completely sheltered from all except south-easterly winds, and is partly protected from these 40 by the islets within it.

Chart 2774.

About 2 miles north-westward of the swing bridge, Murterski kanal leads into Pirovački zaliv between Rt Rat, the extremity of a peninsula extending north-westward from the mainland, and Rt Artić, 45 situated on Otok Murter, about half a mile north-westward. Vessels drawing up to 6 feet (1^m8) can pass through the narrow channel at the swing bridge.

Chart 1581, plan of Murter bay.

A number of islets and dangers lie in the southern approach to 50 Murterski kanal. Greben Bačvica, with a depth of one foot (0^m3) over it, which is marked by a stone beacon, 11 feet (3^m4) high, lies about

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Chart 1581, plan of Murter bay.

a mile south-south-eastward of Rt Obinuš Veli (*Lat.* 43° 46' N., *Long.* 15° 42' E.). See view. The light on Rt Tijaščica, page 293, in sight, bearing less than 128°, leads south-westward of Greben Bačvica.

5



Greben Bačvica beacon.

10

A rocky patch, with a depth of 7 fathoms (12^m8) over it, lies about 2 cables south-south-westward of Rt Obinuš Veli.

Otočići Dražemac (Dražamaski) lie south-south-eastward of Rt Rat, the smaller, which is 85 feet (25^m9) high, at a distance of 3 cables, and the larger, which is 128 feet (39^m0) high, at a distance of about half a mile. There is a

6-fathom (11^m0) patch about 1½ cables south-south-eastward of the latter islet and a sandbank, with a depth of 7 fathoms (12^m8) over it, lies about 2 cables westward of the smaller of these islets.

Pličina Mijoka (Mioka), with a depth of 2½ fathoms (5^m0) over it, lies about 6 cables westward of the south-western extremity of the larger of Otočići Dražemac and 5½ cables off Otok Murter.

Chart 2774.

Otočići Kukuljari, a group of islets and above-water rocks, are situated from 1½ to 2 miles westward of Rt Rat and about 6 cables off Otok Murter. Otočić Vodnjak, the largest of the group, is 59 feet (18^m0) high; a rocky bank lies close westward of this islet. Otočić Babuljak lies about 2 cables eastward of Otočić Vodnjak, and is 92 feet (28^m0) high. Hrid Kamičić, one foot (0^m3) high, is the westernmost of the group and has a sunken rock close off its north-western side.

Chart 1581, plan of Murter bay.

Hrid Kukuljar, 13 feet (4^m0) high, is the easternmost of the group.

A 4½-fathom (7^m8) patch lies 3 cables north-north-eastward of Hrid Kukuljar.

Light.—A light is exhibited, at an elevation of 43 feet (13^m1), from an iron tower on a stone base, 40 feet (12^m2) in height, on Hrid Kukuljar.

South-eastern end of Murterski kanal.—Islets and dangers.—Otočić Maslinjak, 121 feet (36^m9) high, lies in mid-channel about 6 cables west-north-westward of Rt Obinuš Veli. Otočić Bisage, 75 feet (22^m9) high, lies with its southern extremity about 4 cables north-north-westward of Otočić Maslinjak; a shoal, with a depth of 4½ fathoms (8^m2) over it, lies about a cable south-south-eastward of Otočić Bisage. Otočić Hrbošnjak (Krbošnjak), 66 feet (20^m1) high, lies about 4 cables westward of the southern end of Otočić Bisage, and is connected to the coast of Otok Murter by a bank, about a cable wide, with a depth of 13 feet (4^m0) over it.

Uvala Obinuš Veliki is situated on the north-eastern side of the channel between Rt Obinuš Veli and a projection, 141 feet (43^m1) high, about three-quarters of a mile north-westward; Otočić Mimonjak, 72 feet (21^m9) high, lies about a cable north-westward of the latter projection, with a depth of 4 fathoms (7^m3) between it and the coast of the mainland north-eastward.

Otočić Borov (Borovnik), 98 feet (29^m9) high, lies in mid-channel, with its southern extremity about half a mile west-north-westward of the northern end of Otočić Bisage. Otočić Ljutac, 148 feet (45^m1) high, lies close off the north-western end of Otočić Borov, to

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Chart 1581, plan of Murter bay.

which it is connected by a bank with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it.

Otočić Školjić, 30 feet (9^m1) high, lies in the approach to a shallow inlet on the south-western side of the channel, about half a mile westward of the southern end of Otočić Borov; a $3\frac{1}{4}$ -fathom (5^m9) patch lies about $1\frac{1}{2}$ cables north-eastward of Otočić Školjić. The village of Jezera is situated on the northern side of the inlet.

The town of Tijesno, which contained 2,000 inhabitants in 1931, is situated on the south-western side of the channel, just below the swing bridge. Vessels drawing up to 6 feet (1^m8) can berth alongside the quay off the town.

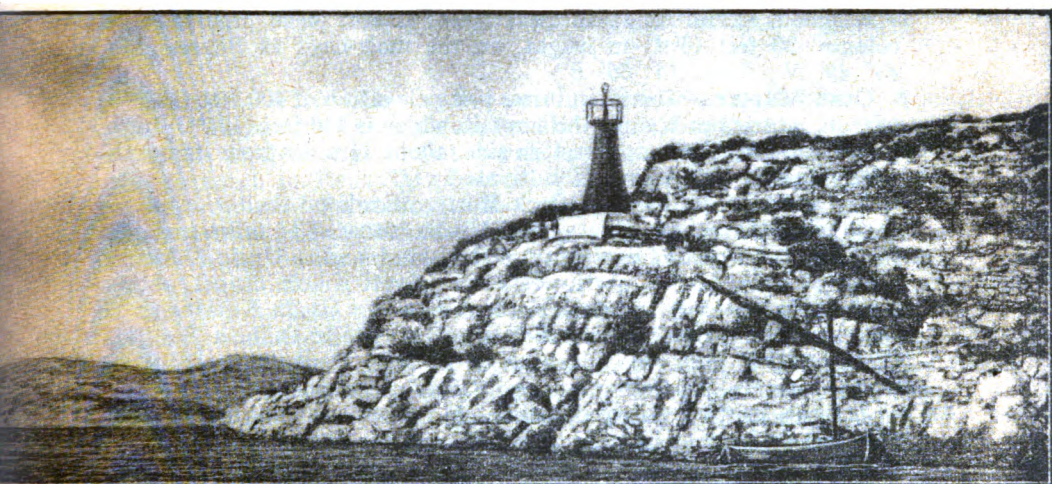
Approaching from south-eastward, the white chapel on the hillock south-eastward of Tijesno is conspicuous.

When the bridge is open there is a passage 13 yards (11^m9) wide.

The current through the narrow part of the channel is usually south-east-going, but is irregular; it sometimes attains a rate of 4 knots.

Lights.—A light is exhibited, at an elevation of 56 feet (17^m1), from a red conical iron tower on a stone base, 23 feet (7^m0) in height, on the south-western side of Otočić Maslinjak.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 13 feet (4^m0) in height, on the head of the mole, situated on the south-western side of the channel about a quarter of a mile south-eastward of the swing bridge (*Lat.* $43^\circ 48' N.$, *Long.* $15^\circ 39' E.$).



Otočić Maslinjak light-tower.

Two lights are exhibited, one at an elevation of 20 feet (6^m1) and the other at an elevation of 13 feet (4^m0), from iron columns, 14 and 7 feet (4^m3 and 2^m1) in height, respectively, situated on the buttresses of the swing-bridge at Tijesno; both show *red* when the bridge is closed, and the northern light shows *red* and the southern light shows *green* when the bridge is open.

Anchorage.—There is good anchorage for vessels of any size in

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Chart 1581, plan of Murter bay.

Uvala Obinuš Veliki, sheltered from the Bora and south-easterly winds, over a bottom of shingle, good holding ground.

Vessels can anchor, in depths of from 11 to 12 fathoms (20^m1 to 5 21^m9), about half a mile south-eastward of the swing bridge.

Chart 2774.

North-western end of Murterski kanal.—Beacon.—The south-western side of this part of the channel is indented and is bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, which is as
10 much as 2 cables wide about 1½ miles north-westward of the swing bridge. The north-eastern side is bordered by a narrow shallow bank. About three-quarters of a mile north-westward of the swing bridge, the fairway, in which there is a depth of 17 feet (5^m3), is very narrow between the banks extending from either side. The bottom, in the
15 northern part of the channel, is rocky.

The village of Betina, which contained 1,800 inhabitants in 1931, is situated on the western side of the channel, near its northern end. A short mole projects south-westward about 3 cables southward of Rt Artić, the north-western entrance point; vessels drawing 4 feet
20 (1^m2) can berth alongside this mole.

Rt Artić is low; a beacon, consisting of a stone cross, stands close off the point.

Lights.—A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron tower, 22 feet (6^m7) in height, on Rt Rat, the north-
25 eastern entrance point of Murterski kanal.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 20 feet (6^m1) in height, on the mole-head at Betina (*Lat.* 43° 49' N., *Long.* 15° 36' E.).

Otok Murter.—This island rises to an elevation of 400 feet (121^m0)
30 near its centre, but Raduč, the summit, which is 410 feet (125^m0) high, is situated near the south-western side, about 1½ miles from its north-western end. The island is cultivated.

The south-western side of Otok Murter affords no shelter, even for small vessels, except in Uvala Sveti Nikola, situated 1½ miles from Rt
35 Rat, the south-eastern extremity of the island, and in Uvala Koširina, about 1½ miles farther north-westward. Sveti Nikola chapel, at the head of the cove of that name, is conspicuous. Uvala Koširina is to some extent protected from onshore winds by Otočić Tužbina (Školjić), 36 feet (11^m0) high, which lies about 2 cables south-eastward of its
40 western entrance point and a short distance offshore.

A 4-fathom (7^m3) patch lies about 1½ cables north-westward of Rt Murterić (Mortara), situated about 2½ miles west-north-westward of Rt Rat.

Hrid Mišine (Kamiac), 7 feet (2^m1) high, lies about a mile westward
45 of Raduč and half a mile offshore. Otočić Školjić, 39 feet (11^m9) high, lies about 6 cables north-north-eastward of Hrid Mišine, connected to the coast by a narrow rocky bank. Otočić Prišnjak, 69 feet (21^m0) high, lies about 4 cables north-westward of Otočić Školjić, connected to the coast of Otok Murter by a narrow bank, with a depth
50 of 2½ fathoms (5^m0) over it. Otočić Maslinjak lies about half a mile north-north-westward of Otočić Prišnjak and 4 cables off the north-western extremity of Otok Murter. A shoal, with a depth of 2½ fathoms (5^m0) over it, lies 2½ cables eastward of Otočić Maslinjak.

Uvala Hramina is entered between the north-western extremity of

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Chart 2774.

the island and Rt Gradina, about a mile eastward; the latter point is the termination of a peninsula extending northward. A shallow bank, on which there are three islets, extends about 6 cables off the western side of Uvala Hramina; Otočić Tegna, the outer islet, is 69 feet (21^m0) high. The two Otočići Vinici, the larger of which is 75 feet (22^m9) high and the smaller, 49 feet (14^m9) high, lie close westward and south-westward, respectively, of Otočić Tegna. The village of Hramina is situated at the head of this bay and the village of Murter, which contained 2,500 inhabitants, in 1931, lies about half a mile south-south-eastward of it. There is a mole at Hramina; vessels drawing up to 8 feet (2^m4) can secure to the north-western side of this mole.

Uvala Zdrače, which is shallow, is entered between Rt Gradina and Rt Artić, 6 cables south-eastward.

Lights.—A light is exhibited, at an elevation of 29 feet (8^m8), from a circular tower, 18 feet (5^m5) in height, on Hrid Mišine (*Lat.* 43° 49' N., *Long.* 15° 34' E.).

A light is exhibited, at an elevation of 54 feet (16^m5), from a white octagonal tower and dwelling, 20 feet (6^m1) in height, on the north-western side of Otočić Prišnjak.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column on a concrete base, 24 feet (7^m3) in height, on the north-eastern side of Otočić Tegna.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column on a stone base, 17 feet (5^m2) in height, on the molehead at Hramina.

COAST.—Pirovački zaliv and approaches.—Beacon.—A chain of islets extends north-westward of Otok Murter, and, together with the northern end of that island, forms the south-western side of the approach to Pirovački (Pirovac) zaliv. The two Otočići Artice, the outermost of the chain, lie about 2½ miles north-westward of the north-western end of Otok Murter; the larger of these islets is 52 feet (15^m8) high, and the smaller, about a cable north-eastward, is 56 feet (17^m1) high.

Otočić Arta Vela, the largest of the chain, is situated on the end of a bank, with depths of less than 3 fathoms (5^m5) over it, extending from Otok Murter; its north-western end, which is 312 feet (95^m1) high, lies about 2 cables south-eastward of Otočići Artice. Otočić Arta Mala, 262 feet (79^m9) high, lies with its western end close off the south-eastern end of Otočić Arta Vela, with a depth of 10 feet (3^m0) between. Otočić Prišnjak Mali, 39 feet (11^m9) high, lies close southward of Otočić Arta Mala and the two Otočići Gubavci lie, close together, in the middle of the entrance to the bight formed between the southern end of Otočić Arta Vela and the western side of Otočić Prišnjak Mali.

Otočić Radelj, 216 feet (65^m8) high, lies close south-eastward of Otočić Prišnjak Mali, with depths of 13 feet (4^m0) between, and Otočić Zminjak (Sminjak), 105 feet (32^m0) high on its eastern side, lies close south-eastward of Otočić Radelj, with depths of 12 feet (3^m7) between; there are depths of 10 feet (3^m0) between Otočić Zminjak and the larger of Otočići Vinici.

Greben Kušija, with a depth of less than 6 feet (1^m8) over it, lies

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M

Chart 2774.

near the outer end of a rocky bank which extends about 3 cables from the north-eastern extremity of Otočić Arta Vela, leaving a narrow passage, in the fairway of which there is a depth of 23 feet (7^m0), between it and the south-western extremity of a projection, 125 feet (38^m1) high, on the mainland eastward. The south-western side of Greben Kušija is marked by an iron pole beacon, 10 feet (3^m0) high, with a ball top-mark. There is a depth of about 15 feet (4^m6) between the beacon and Otočić Arta Vela.

- 10 A shoal lies about a cable off the eastern side of Otočić Arta Mala.

On the north-eastern side of the approach to Pirovački zaliv, Uvala Malaluka and Uvala Velikaluka lie westward and eastward, respectively, of Rt Mala Zečica, the termination of a promontory extending south-south-westward from the mainland, about 2 cables north-eastward of Otočić Arta Mala. Rt Ovnja, the eastern entrance point of Uvala Velikaluka, lies 3 cables eastward of Rt Mala Zečica. The head of Uvala Velikaluka is shallow but small vessels, with local knowledge, can anchor just within the entrance, sheltered from all winds.

- 20 Hrid Splićac lies about 1½ miles south-eastward of Rt Ovnja and close offshore; a shoal, with a depth of 4½ fathoms (8^m7) over it, extends about 1½ cables southward of Hrid Splićac.

Uvala Prosika, with a village of the same name at its head, is situated about three-quarters of a mile east-south-eastward of Hrid Splićac.

- 25 An embanked channel, about half a mile long, leads into Vransko (Vrana) jezero from Prosika; this channel can only be used by boats. A stone cross stands a short distance south-eastward of the southern end of the channel.

- Pirovački zaliv is entered between Prosika and Rt Rat, about 30 1½ miles south-south-westward. Otočić Sustipanac (Sustjepan), 36 feet (11^m0) high, lies about a mile south-south-eastward of Prosika and 2 cables off the north-eastern side of the bay; there are the ruins of a monastery on this islet. A detached 2½-fathom (5^m0) patch lies about 1½ cables off the north-eastern side of the bay, about 1½ miles 35 south-eastward of Otočić Sustipanac.

On the south-western side of the bay, Uvala Jazina is entered between Rt Rat and a point about a mile south-eastward.

- The village of Pirovac, which contained 1,800 inhabitants, in 1931, is situated on the north-eastern side of the bay, near its head. There 40 is a quay, with a small jetty extending from its southern end, on the western side of the village, and another quay on the south-eastern side of the village. There are depths of 8 feet (2^m4) at the head of the jetty.

- Lights.**—A light is exhibited, at an elevation of 23 feet (7^m0), from 45 a circular tower, 24 feet (7^m3) in height, on the south-western side of the western of the two Otočići Artice (*Lat.* 43° 52' N., *Long.* 15° 32' E.).

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 18 feet (5^m5) in height, on the southern end of the western quay at Pirovac.

- 50 **Anchorage.**—Vessels can anchor westward of Pirovac over a bottom of sand, good holding ground.

Directions.—A vessel should not proceed into Pirovački zaliv without local knowledge. The passages most frequently used are either that between Otočić Arta Vela and the mainland, passing on

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either side of Greben Kušija, or that between Otočić Prišnjak Mali and Otočić Radelj.

Coast.—Beacon.—Uvala Žakan, situated on the mainland one mile northward of Otočić Arta Vela, affords shelter to small vessels from most winds ; there are depths of 7 fathoms (12^m8) at the entrance. Large vessels can anchor temporarily about 4 cables west-south-westward of the southern entrance point of this cove, in depths of from 13 to 15 fathoms (23^m8 to 27^m4), mud, good holding ground.

Between the north-western entrance point of Uvala Žakan and a point about 1½ miles north-westward, there is a bight. Uvala Dugovača (Tunjara) lies at the south-eastern end of this bight ; this cove is open westward, but is partially sheltered by the two Otočići Žavinci (Zavinac), which lie 3 and 5 cables, respectively, north-westward of its southern entrance point, and 2 cables offshore. There is a 3-fathom (5^m5) bank at the head of this cove, outside which there are depths of 8 and 10 fathoms (14^m6 and 18^m3). A hill, 371 feet (113^m1) high, stands about 2 cables inland from the head of the cove ; there is anchorage here, suitable for vessels of medium size. The Bora blows strongly and is unsteady in direction ; boulders, to which hawsers can be secured, are available ashore. A vessel proceeding to the anchorage should pass between Otočići Žavinci and the southern entrance point of Uvala Dugovača ; the passage northward and eastward of the islets is not so good, the depths in it being uneven.

The village of Pakoštane, which contained 1,850 inhabitants, in 1931, is situated at the north-western end of this bight, about a mile north-westward of Otočići Žavinci. The harbour of Pakoštane is formed by two small moles and is protected by a shallow bank which extends about 4 cables southward from the shore close north-westward of the village ; Otočić Veli Školj, 95 feet (29^m0) high, lies on the south-western end of this bank, and Otočić Sveti Justina, 16 feet (4^m9) high, on the south-eastern end. Otočić Babuljaš, 39 feet (11^m9) high, lies close north-westward of Otočić Veli Školj.

A shoal, with a depth of 1½ fathoms (2^m3) over it, lies close eastward of Otočić Sveti Justina ; this shoal is marked, on its eastern side, by a stone beacon, 10 feet (3^m0) high, with iron bollards on it. There are depths of about 2 fathoms (3^m7), rock, in the fairway of the approach to the harbour ; vessels drawing up to 10 feet (3^m0) can secure to the inner side of the south-eastern mole.

Light.—A light is exhibited, at an elevation of 14 feet (4^m3), from an iron column, 13 feet (4^m0) in height, on the head of the south-eastern mole at Pakoštane (*Lat.* 43° 54' N., *Long.* 15° 31' E.).

Off-lying islands.—A group of islands and islets lies westward and south-westward of Otočić Arta Vela. Otok Vrgada, which is 371 feet (113^m1) high, the largest of the group, lies with Rt Kranje, its south-eastern extremity, about 1½ miles westward of the southern extremity of Otočić Arta Vela. The south-western side of Otok Vrgada is steep and covered with forest ; the north-eastern slopes are gradual and cultivated. From north-eastward, a chapel on the summit is conspicuous, and also the reddish-coloured slopes on the northern coast. A shoal, with a depth of 5 fathoms (9^m1) over it, lies close off the north-western extremity of the island and Otočić Artina, 56 feet (17^m1) high, lies close off the north-eastern extremity, connected by a drying bank. Uvala Sveti Andrija, which is shallow and rocky, is

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Chart 2774.

situated at the north-western end of Otok Vrgada, and Uvala Luka, with an artificial boat harbour at its head, is situated on the north-eastern side of the island. A shoal, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies about a cable eastward of Rt Kranje.

Otočić Šipnata, 79 feet (24^m1) high, lies about 3 cables off the south-western side of Otok Vrgada and Otočići Obrovanj, consisting of an islet, 36 feet (11^m0) high, with a 16-foot (4^m9) high rock close north-westward of it, and another above-water rock about $1\frac{1}{2}$ cables north-eastward of it, lie on a bank which extends about $3\frac{1}{2}$ cables from the south-western end of the same island. A 2-fathom (3^m7) patch lies about 3 cables east-north-eastward of the 36-foot (11^m0) high islet.

Otočić Murvenjak, 207 feet (63^m1) high, lies about three-quarters of a mile southward of Otok Vrgada, with three islets between; Otočić Oblik, the westernmost of these three islets, is 82 feet (25^m0) high and is connected to the north-western end of Otočić Murvenjak by a bank, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it. Otočići Rakite (Šcoglic), the other two islets, lie about 2 cables north-eastward, and 4 cables east-north-eastward, respectively, of Otočić Oblik. A detached 2-fathom (3^m7) patch lies about half a mile north-north-eastward of the south-eastern extremity of Otočić Murvenjak.

Otočić Gira (Gida), 52 feet (15^m8) high, lies about $1\frac{1}{2}$ cables off a projection extending south-westward from the north-western end of Otočić Murvenjak, with a depth of $4\frac{1}{2}$ fathoms (8^m7) between. Otočići Vrtlići (Vrtlač), consisting of an islet 23 feet (7^m0) high, with a 6-foot (1^m8) high rock about 2 cables west-north-westward of it, lie about 3 cables off the south-western side of Otočić Murvenjak.

Otočić Visovac, 112 feet (34^m1) high, lies about $5\frac{1}{2}$ cables eastward of the south-eastern end of Otočić Murvenjak and 8 cables west-north-westward of Otočić Prišnjak, page 310.

Otočić Kozina, 82 feet (25^m0) high, with Otočić Kamičić, 16 feet (4^m9) high, about a cable eastward of it, lies about $3\frac{1}{2}$ cables northward of the north-western end of Otok Vrgada; a $4\frac{1}{2}$ -fathom (8^m7) patch lies one cable northward of Otočić Kamičić (*Lat.* $43^{\circ} 52' N.$, *Long.* $15^{\circ} 29' E.$).

The group of islets described above lies in the middle of the southern approach to Pašmanski kanal; a number of other islets lie on the western side of that approach.

Otočić Obunj, the southernmost of these islets, is 72 feet (21^m9) high and lies about a mile west-north-westward of Otočić Šipnata; a shoal, with a depth of $5\frac{1}{2}$ fathoms (9^m6) over it, lies midway between these two islets. A bank extends about half a mile northward from Otočić Obunj, with a depth of $4\frac{1}{2}$ fathoms (8^m2) over its outer end and a depth of 3 fathoms (5^m5) over its centre.

Otočić Gangaro (Kankar), 79 feet (24^m1) high, lies with its south-eastern extremity about half a mile north-westward of Otočić Obunj. Otočići Kotule (Kotola), three in number, lie on a bank which extends 2 cables north-eastward and 6 cables eastward from the north-eastern side of Otočić Gangaro; the middle and largest of these islets is 46 feet (14^m0) high. A sunken rock lies about a cable north-westward of the western islet. There is good anchorage for small vessels, with local knowledge, during southerly winds between the westernmost of Otočići Kotule and Otočić Gangaro, northward of the $4\frac{1}{2}$ -fathom (7^m8) bank which connects them.

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To face page 315.

Okošć
Galatijah.

Turanj.



Chapel.

Okošć
Bisaga (3).

Okošć
Komornik.

Okošć
Babac.

Lighthouse.

Pašman.

Pašmanski kanal from northward.
(Original dated 1910.)

Okošć
Babac.

Okošć
Komornik.

Okošć
Galatijah.

Okošć
Ribat.

Chapel.

Turanj.



Pašmanski kanal.—Eastern channel from south-eastward.
(Original dated 1910.)

Chart 2774.

Otočić Žižanj, 164 feet (50^m0) high, lies with its southern extremity about 3 cables north-westward of Otočić Gangaro and its northern side connected to the southern end of Otok Pašman by a narrow bank over which there is a depth of 2½ fathoms (4^m6).

The two Otočići Ošljaci, the western of which is 39 feet (11^m9) high, lie about 6 cables and one mile, respectively, eastward of the southern extremity of Otočić Žižanj; depths of 4½ fathoms (7^m8) extend a short distance westward of the eastern islet. A rock, with a depth of 3 feet (0^m9) over it, lies 3 cables north-north-westward of the western of these two islets and about 2 cables off the eastern side of Otočić Žižanj; depths of 2½ fathoms (4^m1) extend a short distance northward of the sunken rock, and a 5½-fathom (10^m1) patch lies about 1½ cables south-eastward of the same rock.

Rt Borovnjak, the south-eastern extremity of Otok Pašman, lies about 8 cables east-north-eastward of Otočić Žižanj; a shoal, with a depth of 2½ fathoms (4^m6) over it, lies about 1½ cables off this point.

Otočić Gnalić (Kamicic), 36 feet (11^m0) high, lies about three-quarters of a mile eastward of Rt Borovnjak (*Lat.* 43° 53' N., *Long.* 15° 27' E.); this islet is almost bare and whitish, and therefore inconspicuous under some conditions.

Uvala Triluke.—This cove, situated at the south-eastern end of Otok Pašman, westward of Rt Borovnjak, affords shelter during a Bora, but hawsers should be secured to the shore. The bottom consists of sand and gravel, good holding ground. The cove is exposed to the Scirocco which causes a heavy sea.

Chart 2774, with plan of Pašman strait.

PAŠMANSKI KANAL.—**General description.**—The navigation of Pašmanski (Pašman) kanal is rendered difficult by the numerous islets, rocks, and shoals, and the currents in the vicinity of the village of Pašman, at the narrowest part of the channel. The country on both sides of the channel is cultivated and produces oil and wine. See views facing this page.

The channel is divided into two by islets; the south-western part, between Otočić Babac and the village of Pašman, is the deeper and the more frequently used.

The Bora occasionally blows in the channel with violence and causes a short heavy sea; the Scirocco likewise can reach considerable strength, and when against the tidal stream causes a considerable breaking sea. A south-westerly wind is deflected in the entrance, and blows in the channel from southward or south-south-eastward.

The bottom is almost everywhere sand and shells, and the water being very clear the depth often appears less than it is. Both tidal streams are very perceptible, and sometimes attain a rate of 2 knots or more. When the current is opposed by a strong wind an increase in depth takes place, especially at the narrowest parts.

The north-eastern side of the channel is bordered by a 3-fathom (5^m5) bank, as much as 3 cables wide in places. This side of the channel is backed by a range of hills of desolate aspect, the summit of which, Vrčevo, elevated 700 feet (213^m4), is situated about 9 miles north-westward of Pakoštane and 1½ miles inland.

The north-eastern side of Otok Pašman, which forms the south-

Chart 2774, with plan of Pašman strait.

western side of the channel, slopes gently and is bordered by a shallow bank which extends a considerable distance offshore in places.

Pašmanski kanal is entered from south-eastward between Otočić 5 Veli Školj, page 313, and Rt Borovnjak. On the north-eastern side, Otočić Oštarije (Ostaria), 3 feet (0^m9) high and covered with grass, lies on the southern end of a reef which extends about 2 cables off a point, situated about 1½ miles north-westward of Otočić Veli Školj; a spit, with a depth of 3½ fathoms (5^m9) over it, extends about 3 cables 10 south-eastward of Otočić Oštarije. The light on Otočić Sveta Kata is not visible over this islet and spit. Uvala Crvena Luka (Rosso), where small craft can shelter during a Bora, lies eastward of Otočić Oštarije (*Lat. 43° 55' N., Long. 15° 28' E.*).

Rt Prućanik lies about a mile north-westward of Otočić Oštarije 15 and the town of Biograd, which contained about 1,900 inhabitants, in 1931, is situated on a small peninsula, about 1½ miles farther north-westward; the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about 2 cables wide off Rt Prućanik.

On the south-western side of the channel, a shoal, with a depth of 20 2 fathoms (3^m7) over it, lies close off the south-eastern end of Otok Pašman, about half a mile north-north-eastward of Rt Borovnjak.

Chart 2774, plan of Pašman strait.

The village of Tkon, which contained 840 inhabitants, in 1931, lies about 2½ miles north-north-westward of Rt Borovnjak. Here there 25 is a small artificial boat harbour protected by a mole extending about half a cable north-eastward and then a short distance north-westward. Vessels drawing up to 8 feet (2^m4), and 131 feet (39^m9) long, can berth along the south-western side of the mole. The chapel above the village is conspicuous.

30 Otočić Sveta Kata, 82 feet (25^m0) high, and covered with trees, lies nearly in mid-channel, about 6 cables north-eastward of Tkon. This islet is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which is 1½ cables wide on its western side and about 2 cables wide on its eastern side; a rock, with a depth of 1½ fathoms (3^m2) over 35 it, lies 1½ cables off its eastern side and a shoal, with a depth of 4½ fathoms (8^m2) over it, lies about 3 cables eastward of the southern extremity of the islet.

Otočić Planac, 56 feet (17^m1) high, and sparsely covered with brushwood, lies about 2 cables north-north-westward of Otočić Sveta Kata, 40 with depths of about 5½ fathoms (10^m5) in the fairway of the passage between. This islet is bordered by a narrow shallow bank and is connected to the coast of Otok Pašman, south-westward, by a bank with depths of less than 6 fathoms (11^m0) over it.

Between Tkon and the village of Pašman, which contained 750 45 inhabitants, in 1931, 2½ miles north-north-westward, there is a shallow bight. The village of Ugrinić lies about a mile north-westward of Tkon, and the village of Kraj, about half a mile farther north-westward; both these villages have small boat harbours. The belfry of the church of Sveti Benedikt, on a hill, 295 feet (89^m9) high, about 50 a quarter of a mile south-eastward of Ugrinić and a short distance inland, and the belfry of Franjevački (Sveti Frane) monastery at Kraj, are conspicuous.

A chain of four islets extends south-eastward from a position about 1½ cables south-eastward of the village of Pašman; Otočić Čavata,

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Chart 2774, plan of Pašman strait.

39 feet (11^m9) high, bare and of a light colour, is the south-easternmost and lies about half a mile westward of Otočić Planac. The others are Otočić Veliki Dužac, 39 feet (11^m9) high, and partly cultivated; Otočić Mali Dužac, which is low and covered with bushes; and Otočić Muntan (Monton), 43 feet (13^m1) high, and covered with bushes. These islets form the south-western edge of the narrows.

Telegraph cable.—A submarine cable, indicated on the chart, crosses the channel between Tkon (*Lat. 43° 55' N., Long. 15° 25' E.*), and Biograd. Anchorage is prohibited in the vicinity of the cable.

Channel.—**Buoy.**—On the north-eastern side of Pašmanski kanal, there is a small harbour at Biograd, formed by two small moles extending from the south-western side of the peninsula on which the town stands. There are depths of about 2 fathoms (3^m7) along both sides of the northern mole, at a short distance from its root. A quay extends about 200 feet (61^m0) northward of the harbour.

A shallow reef, marked on its western side by a black buoy surmounted by a cone, extends about a cable north-north-westward from the peninsula, and a spit, with a depth of 3 fathoms (5^m5) over its outer part, extends about 2½ cables farther north-north-westward.

Between Biograd and the village of Turanj, about 2 miles north-westward, there is a bight. The village of Filip-Jakov, which contained 900 inhabitants, in 1931, lies about 1½ miles north-westward of Biograd and has a conspicuous church belfry. Here there are three small harbours formed by moles; small vessels can secure to the south-western side of the south-eastern mole of the centre harbour, where there are depths of 10 feet (3^m0).

At Turanj there is a mole about half a cable long, with depths of about 7 feet (2^m1) along the outer part of its north-western side; along the inner part of this side of the mole, there are some sunken rocks. During strong southerly winds, the inner part of the mole is submerged. A short distance farther north-westward, there is a smaller mole.

The shore bank, with depths of less than 3 fathoms (5^m5) over it, is about 2 cables wide off Turanj and Pličina Minerva, some detached patches, are situated near its outer edge; the shoalest of these patches has a depth of 2½ fathoms (4^m1) over it, and lies about 1½ cables south-westward of the molehead.

Otočić Babac, the largest islet in the channel, lies with its western extremity about 2 cables eastward of the mole at the village of Pašman. The islet is 105 feet (32^m0) high, and partly covered with brushwood and partly cultivated; the village of Babac lies on the north-eastern side of the islet, and there is a small boat harbour near the low western extremity of the islet. Otočić Babac is surrounded by a bank, with depths of less than 2½ fathoms (5^m0) over it, which is as much as a cable wide in places on its north-eastern and south-western sides, and extends about 4 cables north-north-westward from its northern end. Otočić Komornik, 62 feet (18^m9) high, and partly cultivated, lies on the outer end of this bank, with its southern end 1½ cables from Otočić Babac.

Otočić Frmić, 29 feet (8^m8) high, on which there is a ruined monastery, lies about 2½ cables south-south-eastward of Otočić Babac.

The harbour of Pašman, on the south-western side of the channel, is formed by two moles; vessels drawing up to 8 feet (2^m4) can secure

Chart 2774, plan of Pašman strait.

to the south-western side of the south-eastern mole. The point on which the village is situated is low and flat. The belfry of the church standing on the south-eastern side of Uvala Lučina is conspicuous.

- 5 The latter cove, which is shallow and exposed to the Bora, is entered between a point about 2 cables north-westward of the harbour at Pašman and a point about $2\frac{1}{2}$ cables farther north-westward.

Rt Brižine lies about three-quarters of a mile north-westward of the harbour at Pašman. Between a point about half a mile west-
10 north-westward of Rt Brižine, and Rt Sveti Mihovila, about half a mile farther north-westward, there are two bays, separated by a projection on which the village of Mrljane (Gmera) is situated. At this village there is a harbour for small vessels and also a boat harbour.

Otočić Garmenjāk, 75 feet (22^m9) high and partly covered with
15 bushes and grass, lies about three-quarters of a cable northward of the eastern entrance point of Uvala Taline (Garma), the south-eastern bay, to which point it is connected by a shallow bank. There is good anchorage, protected southward, for small vessels westward or south-westward of Otočić Garmenjāk.

20 Rt Nevidane lies about half a mile north-westward of Rt Sveti Mihovila. Here a mole projects a short distance westward; there are depths of 9 feet (2^m7) along the south-western side of the head of this mole, the only part to which vessels can secure. The village of Nevidane, in which there is a conspicuous belfry, lies about a quarter of
25 a mile inland from the point.

Hrid Školjić (Garmenjāk), 20 feet (6^m1) high, surrounded by a bank, with depths of less than $2\frac{3}{4}$ fathoms (5^m0) over it, which is as much as a cable wide on its south-western side, lies about 3 cables north-eastward of Rt Sveti Mihovila (*Lat.* $43^\circ 58' N.$, *Long.* $15^\circ 21' E.$).

30 On the north-eastern side of the channel, Rt Tukljačan lies about a mile north-westward of Turanj; the shore bank, with depths of less than 5 fathoms (9^m1) over it, extends about 7 cables west-north-westward of Rt Tukljačan. A group of islets lies on this bank. Otočić Galešnjak, the largest of this group, lies with its north-eastern extrem-
35 ity about 3 cables north-westward of Rt Tukljačan; this islet is covered with bushes and light in colour, it has two conical peaks, one 98 feet (29^m9) high near its north-western end, and the other, 118 feet (36^m0) high, near its north-eastern end. Otočić Ričul, 82 feet (25^m0) high, lies about a cable south-eastward of Otočić Galešnjak and
40 $1\frac{1}{2}$ cables offshore. Otočić Bisaga Mali, 36 feet (11^m0) high, the outermost of the group, lies about a cable off the north-western end of Otočić Galešnjak, with Otočić Bisaga Veliki, 56 feet (17^m1) high, close off its north-eastern side.

Chart 2774.

45 Rt Krmčine lies about $1\frac{1}{2}$ miles north-westward of Rt Tukljačan, with the village of the same name on the coast about 3 cables east-south-eastward.

Between Rt Krmčine and Rt Plitkača (Soline), $3\frac{1}{2}$ miles north-westward, there is a bight. Off Rt Kažela, 6 cables east-south-east-
50 ward of Rt Plitkača, the shore bank, with depths of less than 5 fathoms (9^m1) over it, is half a mile wide.

On the south-western side of the channel, the village of Dobropoljana, in which the church is conspicuous, lies about a mile north-westward of Rt Nevidane; there is a small exposed boat harbour here.

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At the head of Uvala Sveti Kuzma, about $1\frac{1}{2}$ miles west-north-westward of Dobropoljana, there is another exposed boat harbour; the village of Banj lies a short distance inland from the head of this cove.

Uvala Sveti Luka is situated about a mile north-westward of Uvala Sveti Kuzma, with the village of Ždrelac at its head. On the eastern side of this cove, there is a small harbour formed by moles. Vessels, drawing up to 5 feet (1^m5), can berth along the south-western side of the outer end of the north-eastern mole.

Uvala Polača lies between the western entrance point of Uvala Sveti Luka and Rt Artina, the northern extremity of Otok Pašman.

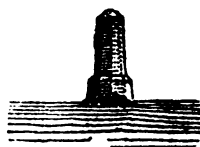
Pašmanski kanal leads into the south-eastern end of Zadarski kanal between Rt Artina and Rt Plitkača, about 2 miles north-eastward.

Chart 2774, plan of Pašman strait.

Dangers in Pašmanski kanal.—Beacon.—Buoy.—A sandbank, with a least depth of 2 fathoms (3^m7) over it, lies from one to 2 cables south-eastward of Otočić Frmić. The belfry of the church in Filip-Jakov in line with the beacon marking Pličina Kočerka, bearing 009° , leads about $1\frac{1}{2}$ cables eastward of this sandbank and close westward of a 5-fathom (9^m1) patch, which lies about $2\frac{1}{2}$ cables north-westward of the south-western extremity of Otočić Planac. Otočić Frmić and this sandbank are situated on the northern part of a bank which extends south-westward to Otočić Čavata and Otočić Veliki Dužac; the leading mark into the western channel passes over the latter bank in a depth of $4\frac{1}{2}$ fathoms (7^m8).

Pličina Kočerka (Kočensko) lies from 4 to 5 cables eastward of the south-eastern extremity of Otočić Babac; the centre of this shoal, which is rocky and above water, is marked by an octagonal stone beacon (*Lat. $43^\circ 57' N.$, Long. $15^\circ 25' E.$*). See view.

Pličina Kočerka is covered by the red sector of Biograd light, between the bearings of 138° and 145° . About half a mile north-westward of Pličina Kočerka there are two $3\frac{1}{2}$ -fathom (5^m9) patches, close together, and about 2 cables off Otočić Babac; a $2\frac{1}{2}$ -fathom (5^m0) patch lies about a cable farther north-westward.



Pličina Kočerka beacon.

A shoal, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies near the middle of the western channel, about a cable southward of the light-tower on the western extremity of Otočić Babac. This shoal is marked, on its southern side, by a conical buoy, painted in black and white bands, with a spherical topmark; a $2\frac{1}{2}$ -fathom (5^m0) patch lies about three-quarters of a cable farther south-south-eastward.

Pličina Gorskovski, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, lies about $2\frac{1}{2}$ cables north-north-westward of light-tower on Otočić Babac, and a $4\frac{1}{2}$ -fathom (7^m8) patch lies a short distance farther north-eastward. The light-structure close off the north-eastern extremity of Otočić Čavata in line with the light-tower near the western extremity of Otočić Babac, bearing about 143° , leads south-westward of Pličina Gorskovski and north-eastward of the bank off Rt Brižine.

A shoal, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it, lies about $1\frac{1}{2}$ miles north-westward of Rt Nevidane and 4 cables off the south-western side of the channel.

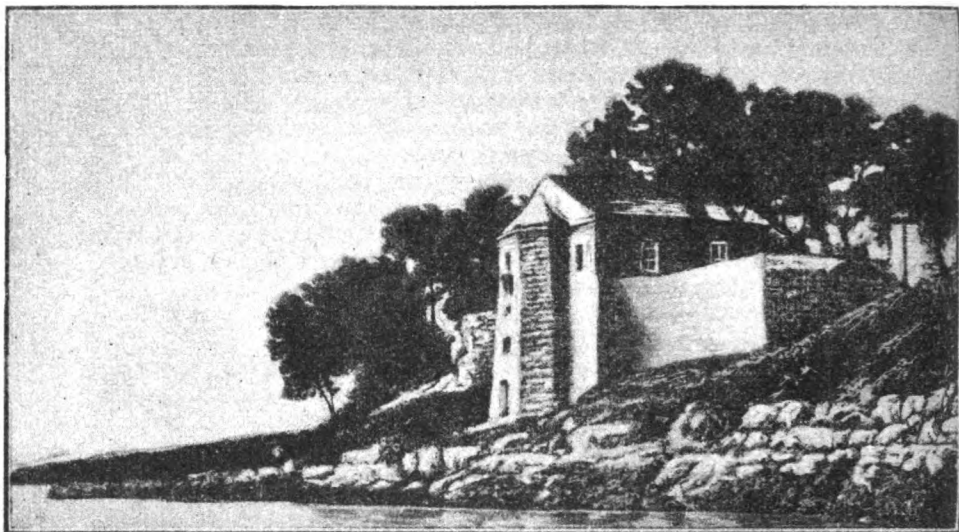
Lights.—A light is exhibited, at an elevation of 38 feet (11^m6),

Charts 1440, 2158a.

M*

Chart 2774, plan of Pašman strait.

from the balcony of a dwelling, 28 feet (8^m5), in height, on the south-western side of Otočić Sveta Kata. *See view.*



Otočić Sveta Kata lighthouse.

(Original dated 1943.)

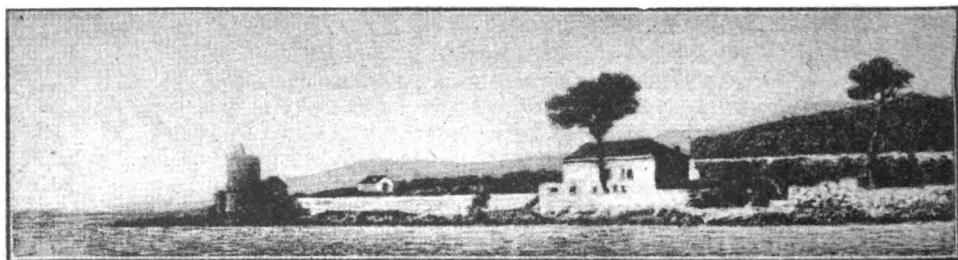
A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 16 feet (4^m9) in height, on the molehead at Tkon (*Lat.* 43° 55' N., *Long.* 15° 22' E.).

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column on a concrete base, 17 feet (5^m2) in height, on the head of the northern mole at Biograd.

- 10 A light is exhibited, at an elevation of 28 feet (8^m5), from a red iron pyramid, 32 feet (9^m8) in height, close off the north-eastern extremity of Otočić Čavata.

- A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 16 feet (4^m9) in height, on the head of the south-eastern mole
15 of the centre harbour at Filip-Jakov.

A light is exhibited, at an elevation of 25 feet (7^m6), from a stone tower on a white hut, 25 feet (7^m6) in height, a short distance within the western extremity of Otočić Babac. *See view.*



Otočić Babac light-tower.

(Original dated 1943.)

Charts 1440, 2158a.

Chart 2774, plan of Pašman strait.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 17 feet (5^m2) in height, on the head of the south-eastern mole at the harbour of Pašman.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, on the head of the mole at Rt Nevidane (*Lat.* $43^\circ 59' N.$, *Long.* $15^\circ 21' E.$).

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 16 feet (4^m9) in height, on the molehead at Uvala Sveti Luka.

Anchorage in Pašmanski kanal.—Vessels can anchor north-eastward of Otočić Sveta Kata, with the light-column at Biograd bearing about 063° , distant $1\frac{1}{2}$ cables, in a depth of about $6\frac{1}{2}$ fathoms (11^m9).

Small vessels can anchor 3 or 4 cables northward of Biograd, in a depth of $3\frac{1}{2}$ or $3\frac{1}{2}$ fathoms (5^m9 or 6^m4), sand, good holding ground, and well sheltered from the prevailing winds; they are best with the south-eastern extremity of Otok Pašman in line with the western extremity of Biograd, bearing about 163° , where they are out of the strength of the stream in the channel.

Small vessels can anchor off Filip-Jakov, in a depth of about $4\frac{1}{2}$ fathoms (8^m7), sand, with the belfry of the church bearing 057° , distant about 4 cables, or nearer the shore as convenient.

There is anchorage for small vessels, in a depth of about 4 fathoms (7^m3), between Otočić Bisaga Veliki and the north-eastern end of Otočić Galešnjak, where they are sheltered from the Scirocco.

There is also anchorage three-quarters of a mile north-westward of Otočić Galešnjak, in a depth of $5\frac{1}{2}$ fathoms (10^m1), about half a mile offshore.

Chart 2774.

Directions.—The western channel is the deeper but the more intricate; the eastern is the easier for vessels drawing less than 18 feet (5^m5).

When proceeding to Pašmanski kanal from southward, the passage between the north-western end of Otok Murter and Otočić Arta Vela, on the north-eastern side, and Otok Vrgada and off-lying islets and shoals, on the south-western side, may be used. Or the passage between Otok Vrgada with its off-lying islets, and Otočić Kozina, on the eastern side, and Otočić Obunj and Otočići Kotule, on the western side, may be taken, passing on either side of Otočić Gnalić (Kamicic).

Chart 2774, plan of Pašman strait.

Regulation.—All vessels passing through Pašmanski kanal must do so at reduced speed, so as to avoid damaging the quays and the boats moored to them.

Western channel.—A vessel coming from south-eastward should pass the lighthouse on Otočić Sveta Kata at a distance of $1\frac{1}{2}$ cables and, when about the same distance north-eastward of Otočić Čavata light-structure, steer for Kapelica, a hill, 256 feet (78^m0) high, about a mile north-westward of the village of Pašman, bearing 307° . This course should lead over the bank between Otočić Frmić and Otočić Veliki Dužac in depths of not less than $4\frac{1}{2}$ fathoms (7^m8). On approaching Otočić Muntan, course should be altered northward so as to pass the north-eastern side of that islet at a distance of rather less than a cable, in order to avoid the shallow patches lying about one and $1\frac{1}{2}$ cables southward of the western extremity of Otočić

Chart 2774, plan of Pašman strait.

Babac. When the south-eastern extremity of Otočić Komornik bearing about 021° , is open north-westward of Otočić Babac, the vessel is clear of these patches and can proceed in mid-channel, to
 5 pass south-westward of Pličina Gorskovski. The western extremity of Otočić Babac (*Lat. $43^{\circ} 57' N.$, Long. $15^{\circ} 24' E.$*) in line with the eastern extremity of Otočić Čavata, or, at night, the lights on these islets, in line, bearing about 143° , lead south-westward of Pličina Gorskovski.

In clear weather, when abreast Otočić Planac, Otočić Ošljak (chart
 10 2774), about $12\frac{1}{2}$ miles distant, will be seen over Rt Brižine; see view B on chart 2774. Otočić Ošljak kept bearing 313° , will lead south-westward of the shallow patches southward of the western extremity of Otočić Babac; when past these patches, a vessel should alter course as before directed.

15 *Eastern channel.*—A vessel from the vicinity of Otočić Oštarije, proceeding through the eastern channel, or that between Otočić Babac and the mainland, should steer with the belfry of the church at Turanj in line with the beacon on Pličina Kočerka, bearing 328° , until Rt Pručanik is in line with the south-western fall of Otočić
 20 Arta Vela (see view A on chart 2774), bearing about 138° , when course should be altered, with that bearing being kept astern, until Pličina Kočerka is passed. The north-eastern extremity of Otočić Komornik in line with the western extremity of Otočić Galešnjak, bearing 312° , leads south-westward of Pličina Kočerka, Pličina Minerva, and the
 25 shallow patches midway between these two dangers. When past Pličina Minerva, course can be altered as convenient to pass $1\frac{1}{2}$ cables eastward of Otočić Komornik and between that islet and Otočić Galešnjak. The least depth in the fairway of this channel is $3\frac{1}{2}$ fathoms (5^m9), between Otočić Komornik and the mainland.

30 This channel can also be entered by passing westward of Otočić Sveta Kata and Otočić Planac, keeping the belfry of the church in Filip-Jakov in line with the beacon on Pličina Korčerka, bearing 009° .

The eastern channel should not be used at night by large vessels. See views facing page 315.

35 *Chart 2774.*

Prolaz Ždrelac.—Beacons.—This passage, between Otok Pašman and Otok Uljan, close north-westward, leads into the north-western end of Pašmanski kanal. The fairway of the channel is only 26 feet (7^m9) wide in its narrowest part and has a least depth of 10 feet (3^m0).

40 The centre of the narrowest part of the channel is marked by three white wooden beacons, each surmounted by a triangle. The northernmost of these beacons stands on the coast of Otok Uljan and the southernmost stands in a depth of 8 feet (2^m4), at a distance of about 110 yards (100^m6) from it; these beacons in line, bear about 018° .

45 The narrowest part of the channel is marked by two pairs of iron perches, about half a cable apart. The western perches are each surmounted by a red and white triangle, and the eastern perches are each surmounted by a red and white disc. The southernmost pair of perches are situated about $4\frac{1}{2}$ cables south-south-westward of the
 50 beacon on the coast of Otok Uljan.

The tidal streams in the passage change their direction with the tides and are affected by the wind; during springs these streams may attain a rate of $4\frac{1}{2}$ knots.

The harbour of Ždrelac lies on the south-eastern side of the passage

Chart 2774.

and affords shelter for small vessels from all winds, over a bottom of mud, good holding ground.

Prolaz Ždrelac is entered from north-eastward between Rt Artina, page 319, and Rt Zaglav, the south-eastern extremity of Otok Uljan; Gospa od Sniga, a conspicuous chapel, stands on the latter point, where there is a quay for boats. Anchorage is prohibited in this entrance on account of a submarine cable.

At night, the light on Otočić Karantunić, page 334, is visible through Prolaz Ždrelac.

ZADARSKI KANAL.—General description.—Zadarski (Zadar) kanal, called by the Italians Canale di Zara, is a continuation north-westward of Pašmanski kanal and lies between the mainland, on its north-eastern side, and Otok Uljan, with Otok Rivanj and Otok Sestrunj, lying off the north-western end of that island, on its south-western side.

The north-eastern side of the channel, between Rt Plitkača and Rt Artić (*Lat. 44° 16' N., Long. 15° 07' E.*), 16 miles north-westward, is backed by low hills and cultivated ground. The north-eastern side of Otok Uljan slopes gradually to the sea and is indented with several coves of bold approach; Šćah (Mount Grande), the summit, 945 feet (288^m) high, stands near the middle of the south-western side of the island and Sveti Mihovil castle, which is conspicuous, stands on a hill, 860 feet (264^m) high, about a mile south-eastward. The southern part of the island is wooded.

The dangers in Zadarski kanal are described on page 327.

Current.—See page 36.

Telegraph cables.—Three submarine cables, indicated on the chart, are laid near the middle of the north-western part of Zadarski kanal and landed at Zadar.

Channel.—Otočić Mišnjak, 39 feet (11^m) high, with a depth of 4 fathoms (7^m) close off its western side, lies about 3 cables northward of Rt Artina and the same distance off the coast of Otok Uljan; this islet does not show up well against the coasts of the islands.

Uvala Kukljica lies on the south-western side of a point situated about a mile north-north-westward of Rt Zaglav. There is a small quay here, protected by a mole and also some smaller moles forming a boat harbour. The village of Kukljica, which had a population of 1,700, in 1931, lies at the head of the cove.

Uvala Kukljica affords good shelter to small vessels in winds from the western semicircle, but they must lay out hawsers to the shore as the bottom is rocky and unreliable. A stone cross standing about 2 cables north-north-westward of the light-column on the northern entrance point of the cove, and the belfry of the church in the village are conspicuous.

Uvala Gnjojišća, which affords temporary shelter to small vessels from westerly winds, lies on the northern side of the peninsula which forms the north-eastern side of Uvala Kukljica. Rt Otrić, 148 feet (45^m) high, lies about 1½ miles farther north-westward.

On the north-eastern side of the channel, Luka Sukošan is entered between Rt Podvara (*Lat. 44° 03' N., Long. 15° 18' E.*), situated about half a mile north-westward of Rt Plitkača, and Rt Sveti Ivan, about half a mile farther north-westward; both entrance points have

Chart 2774.

white beaches. A bank, with depths of $3\frac{1}{2}$ fathoms (5^m9) over it, extends across the entrance of this harbour and the sides and both entrance points are bordered by a shallow bank. The village of Sukošan, which had a population of 800, in 1931, lies on the south-eastern side of the harbour. A short mole, to part of which small vessels can secure, extends north-westward from the village. A sunken rock lies close off the head of this mole and an above-water rock lies midway between the molehead and the shore southward. For anchorage, see page 328.

The village of Bibinje, which had a population of 1,350, in 1931, lies about a mile north-westward of Rt Sveti Ivan. There is an artificial boat harbour at Bibinje. Between Bibinje and Punta di Collovare, about 2 miles north-westward, there is a bight; the latter point, on which there is a conspicuous building, is the extremity of a projection extending south-eastward. A spit, with a depth of $3\frac{1}{2}$ fathoms (6^m9) over it, near its outer end, extends about 3 cables southward of this point and, about half a mile south-south-eastward of the point, there is a shoal with a least depth of $4\frac{1}{2}$ fathoms (8^m2) over it. Uvala Sveta Jelena, where there is a customs house and a boat harbour, lies at the head of the bight, about a mile north-north-westward of Bibinje.

Chart 2775.

Valle di Bregdeti (Borgo Erizzo), which is shallow, is situated at the north-western end of the bight, between Punta di Collovare and Punta Marina, $2\frac{1}{2}$ cables north-eastward; Scoglio San Clemente lies midway between the entrance points.

The town of Borgo Erizzo, which contained about 3,720 inhabitants, in 1940, and which has a conspicuous belfry, is situated about half a mile north-westward of Punta di Collovare. For anchorage, see page 328.

Chart 2774.

On the south-western side of the channel, Rt Rahovača lies about three-quarters of a mile north-westward of Rt Otrić. Uvala Batalaža, where there is a boat harbour, is situated close southward of Rt Rahovača.

Luka Kali, with the village of the same name at its head, lies about 4 cables westward of Rt Rahovača (*Lat. $44^{\circ} 04' N.$, Long. $15^{\circ} 13' E.$*). There are two moles and a jetty at Kali, forming a boat harbour. The village contained 2,360 inhabitants, in 1931.

Otočić Ošljak, conical, wooded, and 295 feet (89^m9) high, lies half a mile northward of Rt Rahovača and about 4 cables offshore; it is steep-to and conspicuous. The village of Ošljak, where there is a small harbour, is situated on the north-western side of the islet; vessels drawing up to 10 feet (3^m0) can secure alongside the breakwater.

For anchorage, see page 328.

Chart 2775.

The village of Preko, which contained 3,895 inhabitants, in 1931, lies about $1\frac{1}{2}$ miles north-westward of Kali. There are two boat harbours at Preko, about 3 cables apart. The northern harbour is protected by Otočić Galevac (Sveti Paval), 42 feet (12^m8) high and wooded, which lies close off it, connected to Otok Uljan by a narrow bank, with a depth of 3 feet (0^m9) over it; vessels entering this harbour pass northward of Otočić Galevac.

Rt Sveti Petar (Supetar), on which there is a conspicuous chapel, lies about 4 cables northward of Otočić Galevac.

Charts 1440, 2158a.

Chart 2775.

Beacon.—A stone beacon, about half a cable off Rt Sveti Petar marks the outer end of a shallow reef extending from that point ; depths of less than 4 fathoms (7^m3) extend about half a cable farther south-eastward. In 1945, only the base of this beacon 5 remained.

Channel.—On the south-western side of Rt Sveti Petar there is a shallow cove with a boat harbour in it. The village of Poljana, which contained 1,200 inhabitants, in 1931, lies on the south-western side of this cove. 10

Chart 2774.

Uvala Sutomišćica (Sveta Fuma), is entered between Rt Sveti Grgur, about a mile north-westward of Rt Sveti Petar, and a point about 1½ cables farther north-westward ; there is a conspicuous chapel on Rt Sveti Grgur. The sides of this bay are bordered by a shallow 15 bank which is about 2 cables wide at its head. For anchorage, see page 329.

The village of Sutomišćica is situated on the south-eastern side of the bay and the village of Lukoran Mali on the western side. In the south-eastern part of the bay, there are several moles forming boat 20 harbours. The village of Sutomišćica contained 1,200 inhabitants, in 1931.

Charts 2775 and 2774, with plans of Port of Zadar.

On the north-eastern side of the channel, the town of Zadar, formerly known as Zara, stands on a promontory which extends north-west- 25 ward, parallel with the coast, and the northern extremity of which lies about 1½ miles north-westward of the belfry in Borgo Erizza. See view facing page 329. The south-western side of the town is fronted by Riva Vittorio Emanuele III, from the middle of which, Molo Italo Balbo extends about half a cable south-westward. This quay is 30 bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as a cable wide in places ; a rocky patch, with a depth of 28 feet (8^m5) over it, lies about 1½ cables westward of Molo Italo Balbo. The coastal bank, with depths of less than 5 fathoms (9^m1) over it, extends about a cable off the north-western end of the promontory on 35 which Zadar stands. For anchorage off Zadar, see page 329.

The harbour of Zadar, page 329, is entered between the north-western end of Zadar and Rt Mika (Amica), about a mile north-westward.

Chart 2774.

On the south-western side of the channel, Rt Marović lies about 40 three-quarters of a mile north-westward of Rt Sveti Grgur. Uvala Lukoran Veliki, the entrance to which is about 2 cables wide, lies westward of Rt Marović and affords shelter to small vessels during southerly and westerly winds. The village of Lukoran lies on the 45 south-western side of the cove ; on the eastern side of the cove there is a quay and a small pier. Uvala Frnaža Mali and Uvala Frnaža Veliki (Fornaža), which afford shelter only during southerly winds, lie three-quarters of a mile and one mile, respectively, north-westward of Rt Marović (*Lat.* 44° 06' N., *Long.* 15° 09' E.). 50

Luka Uljan is entered between a point, about 2½ miles north-westward of Rt Marović and a point about a quarter of a mile farther north-westward ; on the latter point there is a monastery, with a stone cross above it, both of which are conspicuous. This cove is shallow and the bottom rocky. The village of Uljan, which contained 1,750 55

Charts 1440, 2158a.

Chart 2774.

inhabitants, in 1931, lies near the head of the cove ; here there is a mole and some boat jetties.

Chart 2775.

- 5 On the north-eastern side of the channel, there is a bight between Rt Mika and Rt Radman, $3\frac{1}{2}$ miles north-westward ; the latter point, being covered with trees, is conspicuous. In the south-eastern part of this bight, called by the Italians Vallone di Dicolo, the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is 2 cables wide.

Chart 2774.

The small village of Diklo, where there is a customs house and a boat jetty, is situated about $1\frac{1}{4}$ miles northward of Rt Mika. For anchorage, *see* page 329.

- 15 On the south-western side of the channel, Uvala Batalaža lies about half a mile north-westward of Luka Uljan and Uvala Sušica, about three-quarters of a mile farther north-westward. Small vessels can anchor in the latter cove during southerly and westerly winds ; within this cove there are a mole and a jetty.

Charts 2774, 2711.

- 20 Otočić Idula (Idolo), conical and 92 feet (28^m0) high, lies about $2\frac{1}{2}$ cables off Rt Sveti Petar, the north-western extremity of Otok Uljan, to which it is connected by a bank, with depth of $3\frac{1}{2}$ fathoms (6^m9) over it. This islet is surrounded by a shallow bank, which is as much as a cable wide off its north-eastern side.

- 25 Otok Rivanj, 367 feet (111^m9) high and mostly covered with shrubs, but partly cultivated, lies with Rt Trogirić (Tragerić), its northern extremity, about $1\frac{1}{2}$ miles west-north-westward of Otočić Idula ; the village of Rivanj and a chapel, both situated near the summit of the island are conspicuous.

Chart 2774.

The south-eastern end of Otok Rivanj is separated from Otok Uljan by Veli Ždrelec, which is $2\frac{1}{2}$ cables wide in its narrowest part and has a least depth of $4\frac{1}{2}$ fathoms (8^m7) in the fairway. The tidal streams in this passage are very perceptible.

- 35 On the north-eastern side of Zadarski kanal, there is a bight between Rt Radman and Rt Skala, about a mile north-westward ; the shores of this bight are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about $1\frac{1}{2}$ cables wide. Off Rt Skala the bank is about 2 cables wide. Luka Petrčane, which is situated on the south-eastern side of this bight, affords good shelter to small vessels, with local knowledge, during north-easterly and south-easterly winds, over a bottom of sand and weed, good holding ground. During north-westerly, westerly and south-westerly winds, the anchorage in Luka Petrčane is dangerous. There is a mole, several boat jetties and facilities for securing to the shore. The village of Petrčane Donje, which contained 700 inhabitants in 1931, is situated at the head of the harbour.

- Between Rt Skala and Rt Artić, about 4 miles north-north-westward, there is a bight, the shore of which is indented with several coves and backed by low hills. The shores of this bight are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which is narrow on the eastern side and as much as half a mile wide in places on the north-eastern side. The village of Zaton (*Lat.* $44^{\circ} 13' N.$, *Long.* $15^{\circ} 10' E.$), with a church, is situated on a hill near the coast, about 2 miles north-north-eastward of Rt Skala. For anchorage, *see* page 329.

Charts 1440, 2158a.

Chart 2711.

On the south-western side of the channel, Otočići Tri Sestrice, of which the north-westernmost is 82 feet (25^m0), the middle, 75 feet (22^m9) and the south-easternmost 33 feet (10^m1) high, lie off the north-western end of Otok Rivanj, the outermost at a distance of about 2 miles; they are covered with brushwood and of a dark aspect. These islets lie on the north-eastern side of Rivanjski kanal, page 349; the dangers in their vicinity are described below. For anchorage, see page 329.

Chart 1561, plan of Maknare channel.

Rt Križa, the north-western extremity of Otok Sestrunj, which island forms the south-western side of Rivanjski kanal, lies about 4 miles north-westward of Rt Trogirić (*Lat. 44° 10' N., Long. 15° 02' E.*).

Chart 2711.

Otok Sestrunj is the highest of the islands in the neighbourhood; 15 Obručar, the summit, situated about 1½ miles south-eastward of Rt Križa is elevated 610 feet (185^m9). This island is mostly covered with bushes, but there is some cultivation. The village of Sestrunj, which contained a population of 425, in 1931, and the church of Sveti Petar (Supetar), a short distance east-south-eastward of it, situated 20 about 2½ miles south-eastward of Obručar, are conspicuous.

Zadarski kanal is entered from north-westward between Rt Križa and Rt Artić.

Chart 2774.

Dangers in Zadarski kanal.—Buoys.—A rocky shoal, with a 25 depth of 4½ fathoms (8^m2) over it, lies about 2½ miles north-westward of Rt Skala (*Lat. 44° 12' N., Long. 15° 09' E.*); a 6-fathom (11^m0) patch lies about three-quarters of a mile south-eastward of this shoal.

Charts 2774, 2711.

Rivanjska (Saida) pličina, with a depth of 2½ fathoms (4^m6) over it and steep-to, lies about a mile north-north-eastward of the northern extremity of Otok Rivanj. A conical buoy, painted in red and black bands, marks this shoal.

A shoal, with a depth of 4½ fathoms (8^m7) over it, lies about 3 cables north-north-eastward of the south-easternmost of Otočići Tri Sestrice. 35

Chart 2711.

A rock, with a depth of 2 feet (0^m6) over it and which breaks, lies about 4 cables north-westward of the north-westernmost of Otočići Tri Sestrice. This rock is marked by a conical buoy, painted in red and black bands and surmounted by a ball.

Chart 1561, plan of Maknare channel.

A rocky shoal, with a depth of 3 fathoms (5^m5) over it, lies about a mile north-westward of the sunken rock, just mentioned, and 4 cables off the northern end of Otok Sestrunj.

Chart 2774.

Lights.—Fog signals.—A light is exhibited, at an elevation of 15 feet (4^m6), from an iron column, 17 feet (5^m2) in height, on the northern entrance point of Uvala Kukuljica.

A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron framework structure, 23 feet (7^m0) in height, standing about a cable 50 westward of Rt Podvara.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron post on the molehead at Sukošan.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron post, 17 feet (5^m2) in height, on the head of the eastern mole at Kali. 56

Charts 2774, 1440, 2158a.

Chart 2774.

A light is exhibited, at an elevation of 57 feet (17^m4), from a circular tower, 31 feet (9^m4) in height, on the north-eastern side of Otočić Ošljak.

5 *Chart 2775.*

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 13 feet (4^m0) in height, on the molehead in the southern harbour of Preko.

Chart 2774.

- 10 A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column on a stone base, 16 feet (4^m9) in height, on Rt Sveti Grgur (Sveta Fuma).

Charts 2775 and 2774, with plans of Port of Zadar.

- A light is exhibited, at an elevation of 26 feet (7^m9), from a circular stone hut with a red cupola, 25 feet (7^m6) in height, on the head of Molo Italo Balbo (Lat. 44° 07' N., Long. 15° 13' E.). This lighthouse was damaged, in 1945.

- 20 A light is exhibited, at an elevation of 21 feet (6^m4), from a circular stone hut with a black cupola, 20 feet (6^m1) in height, on the northern extremity of Riva Derna, which forms the southern entrance point of the harbour of Zadar.

A light is exhibited, at an elevation of 20 feet (6^m1), from a circular stone hut with a red cupola, 20 feet (6^m1) in height, on the head of Molo Porporella, within the harbour of Zadar, page 329.

- 25 A light is exhibited, at an elevation of 58 feet (17^m7), from a green iron framework structure, attached to the dwelling of the signal station, 28 feet (8^m5) in height, on the southern extremity of Rt Mika.

An air fog signal is sounded from Rt Mika.

- 30 During dense fog, the bell of Zadar Cathedral will be rung at intervals of one minute.

Chart 2774.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 18 feet (5^m5) in height, on the pierhead at Lukoran.

- 35 A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 15 feet (4^m6) in height, on the molehead at Uljan.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 19 feet (5^m8) in height on Rt Radman.

Charts 2775 and 2774, with plans of Port of Zadar.

- 40 **Signal station.—Radiobeacon.**—A signal station, consisting of a white dwelling with a gabled roof, is situated on the southern extremity of Rt Mika. This station operates from sunrise to sunset and will transmit, by telegraph, messages received from ships.

There is a radiobeacon near this signal station. See Admiralty List of Radio Signals.

45 *Chart 2774.*

- Anchorage in Zadarski kanal.**—There is anchorage for small vessels in Luka Sukošan, sheltered from all but south-westerly winds, in depths of from 4 to 6 fathoms (7^m3 to 11^m0), north-westward of the village and about 3 cables offshore; inshore of this anchorage, the depths decrease rapidly and the bottom becomes rocky.

Between Bibinje and Borgo Erizzo, there is only indifferent anchorage; small vessels can anchor, in moderate depths, from 2 to 2½ cables offshore.

- 55 Vessels of any size can find well-sheltered anchorage in easterly and westerly winds between Otočić Ošljak and Otok Uljan, in depths of

To face page 329.



Rt Mka.

Mole.

Cathedral.

Zadar. Electric station.

Harbour of Zadar, bearing 124°, distant 3 miles.

(Original dated 1910.)

Chart 2774.

12 or 13 fathoms (21^m9 or 23^m8), mud, good holding ground. This is the only anchorage for large vessels off the north-eastern side of Otok Uljan.

Small vessels can anchor in the middle of Uvala Sutomišćica, in depths of about 7 fathoms (12^m8), sand and good holding ground, but the bay is exposed to the Bora which causes a considerable sea.

Charts 2775 and 2774, with plans of Port of Zadar.

Large vessels can anchor westward of the town of Zadar, in depths of from 15 to 20 fathoms (27^m4 to 36^m6), mud, about 3½ cables offshore or farther out as convenient. For anchorage within the harbour of Zadar, see page 330.

Chart 2774.

The bight between Rt Mika (*Lat. 44° 08' N., Long. 15° 12' E.*) and Rt Radman can be used as an anchorage by vessels of any size; they are tolerably sheltered against the Bora. The best berth for large vessels is west-south-westward of Diklo, from 3 to 5 cables offshore, in depths of 10 or 11 fathoms (18^m3 or 20^m1), mud.

There is anchorage in a depth of about 10 fathoms (18^m3) sand, 1½ miles north-north-westward of Rt Skala, with Zaton church bearing about 090°, distant 2 miles.

Chart 2711.

Vessels may obtain shelter from a Bora by anchoring 1½ cables or more south-westward of the centre of either of the two north-western islets of Otočići Tri Sestrice, in depths of from 9 to 15 fathoms (16^m5 to 27^m4), mud; but this anchorage is exposed to south-easterly and north-westerly winds, and occasionally the current is felt very strongly.

Charts 2775 and 2774, with plans of Port of Zadar.

HARBOUR OF ZADAR.—The entrance to the harbour of Zadar is described on page 325. Conspicuous objects in and near the town of Zadar are: the belfry of the Cathedral, near the centre of the town; the two radio-mastheads, one of which is 43 feet (13^m1) higher than the other; a square chimney in Borgo Barcagno; and, from south-eastward, the cupola of San Demetrio chapel with a college near it, near the southern end of the town. See view facing this page.

The coast in the vicinity of Zadar is generally low, with gradual slopes; Bokanjac, a hill, 344 feet (104^m9) high, situated about 1½ miles north-eastward of Zadar, and covered with vegetation, is conspicuous.

Rt Mika (*Lat. 44° 08' N., Long. 15° 12' E.*) is the termination of a small peninsula extending westward from the mainland. Between this point and the root of Molo Porporella, about a mile south-eastward, the coast is indented and fronted by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as 2½ cables wide in places.

Valle dei Frati is situated on the south-eastern side of Rt Mika; this cove is shallow and only affords shelter for small vessels. There are two short moles in the cove, with depths of 5 and 6 feet (1^m5 and 1^m8), respectively, at their heads.

Punta Ventosa (Vitrnjak) lies about 4 cables east-south-eastward of Rt Mika. A rocky spit, with depths of less than 5 fathoms (9^m1) over it, extends about 3½ cables south-south-eastward from Punta Ventosa. There is a shallow cove north-eastward of this point with a building on its eastern shore.

Seconda Valle di Maistro and Prima Valle di Maistro, both of which are shallow, are entered about 2 and 4 cables, respectively, east-south-

Charts 1440, 2158a.

Charts 2775 and 2774, with plans of Port of Zadar.

eastward of Punta Ventosa. In the former bay there are two piers, the outer of which extends half way across the harbour from its north-western side, and has a depth of 13 feet (4^m0) at its head ; small craft
 5 can secure to this pier. The inner pier is only suitable for boats. There are also some landing steps in this bay. Prima Valle di Maistro is the larger of the two bays and has a number of houses scattered along its shores, and a conspicuous tower on its north-eastern side. This bay is only available for small vessels ; it is sheltered even from north-
 10 westerly winds, which blow freshly there and in squalls during summer. The Bora and Scirocco are weak. There are two boat jetties in this bay, one with a depth of 5 feet (1^m5) at its head and the other with a depth of 4 feet (1^m2).

Lights.—Radio mast.—Dolphin.—The lights in the harbour of
 15 Zadar are described on page 328.

A radio mast, 197 feet (60^m0) in height, stands in the centre of Piazza d'Armi, about half a mile south-south-eastward of Zadar Cathedral ; a three-coloured light is exhibited from the masthead.

A dolphin, with a mooring bollard, stands, in a depth of 8 feet (2^m4),
 20 about 2½ cables northward of Riva Derna light-structure and half a cable offshore ; there is no passage between this dolphin and the coast eastward.

Anchorage.—The anchorage westward of Zadar is described on page 329.

25 There is anchorage off the entrance to Prima Valle di Maistro eastward of an imaginary line joining the signal station on Rt Mika with the light-structure on Molo Porporella, in depths of from 4½ to 5½ fathoms (7^m8 to 9^m6) mud, sand and rock, good holding ground.

Telegraph cables.—Prohibited anchorage.—Three cables, indicated on the chart, are landed at the southern end of Riva Vittorio Emanuele III ; anchorage is prohibited in the vicinity of these
 30 cables.

To keep clear of the fairway to the harbour, vessels are prohibited from anchoring with Rt Mika light-structure (*Lat.* 44° 08' N., *Long.*
 35 15° 12' E.) bearing between 306° and 322°.

Harbour.—Beacon.—The harbour, between the town of Zadar and the mainland, is protected north-westward by Molo Porporella ; the entrance, between the head of that mole and Riva della Sanità, near the northern end of the town, is about 76 yards (69^m5) wide. About
 40 3 cables south-eastward of the entrance, the harbour is crossed by Ponte del Littorio, of reinforced concrete, which has a central swinging span of iron, 49½ feet (15^m0) wide ; the area comprised between this bridge and Molo Porporella is the commercial port.

In 1944, the bridge across the harbour was badly damaged ; the
 45 harbour was then encumbered with wrecks, and a vessel should not enter without local knowledge.

The shores of the harbour are quayed ; on the south-western side, Riva Derna is situated at the northern end and, farther south-eastward, are Riva della Sanità, about 1½ cables long, Riva IV Novembre, about
 50 a cable long, and Riva San Rocco, about 2½ cables long. On the north-eastern side, Valle di Bora lies between Borgo Barcagno, which is fronted by a quay of the same name, and Borgo Ceraria, which is fronted by Riva C. Colombo. Valle dei Ghisi lies at the south-eastern end of the harbour ; on the north-eastern side of this cove, about

Charts 2774, 1440, 2158a.

Charts 2775 and 2774, with plans of Port of Zadar.

1½ cables south-eastward of Ponte del Littorio, there is an embankment with a slipway and a number of small piers.

A framework beacon on a concrete base stands about 2 cables north-westward of the head of Valle dei Ghisi and close off the north-eastern side of the harbour.

Berthing.—Mooring buoy.—Vessels can berth at Molo Porporella, but, owing to its submerged foundation, must not approach the mole within a distance of 20 feet (6^m1). Depths of less than 2½ fathoms (4^m6) extend about a quarter of a cable off Riva Barcagno, south-eastward of Molo Porporella, whence the depths increase rapidly. Water is laid on to the mole.

There are depths of from 12 to 17 feet (3^m7 to 5^m2) alongside Riva Derna south-eastward of the lighthouse on its northern extremity; from 17 to 23 feet (5^m2 to 7^m0) alongside Riva della Sanità; and from 12 to 21 feet (3^m7 to 6^m4) alongside Riva IV Novembre; vessels 426 feet (129^m8) long can berth alongside these quays.

Only boats and small vessels can berth at the quays on the north-eastern side of the harbour; the bottom is rocky here in places. Small vessels can moor in Valle di Bora.

A mooring buoy is moored near the western edge of a bank, with depths of less than 2 fathoms (3^m7) over it, which extends about half a cable off Punta Ceraria at the north-western end of Riva C. Colombo.

Boats can berth alongside the quays in Valle dei Ghisi, where there are depths of from 3 to 5 feet (0^m9 to 1^m5).

Outside the harbour, Riva Derna extends about half a cable south-westward of the light-structure (*Lat. 44° 07' N., Long. 15° 13' E.*) on it; this quay is exposed north-westward and is little used.

Vessels drawing less than 18 feet (5^m5) can berth alongside Molo Italo Balbo, and Riva Vittorio Emanuele III is available for vessels drawing less than 10 feet (3^m0). Securing to either mole or quay is not recommended during north-westerly winds; when approaching, the current or tidal stream, which may attain a rate of 2 knots, must be taken into consideration.

A small basin, entered close south-eastward of Riva Vittorio Emanuele III, is available for boats and small vessels; during westerly winds, it is dangerous to approach the pier which forms the south-eastern side of the entrance to this basin.

Pilotage.—There are no regular pilots, but, on request, the Captain of the Port will arrange to have a vessel piloted from the anchorage to her berth.

Town.—Zadar contained 12,838 inhabitants, in 1940. The principal industries are the manufacture of liquors, tobacco and bread, which also constitute the principal exports; the principal imports are provisions.

Communications.—There is regular steamer communication with the principal Italian ports in the Adriatic and also with Šibenik and Rodi.

There is a radio station. See page 46.

There is a regular air service to Pola, Trieste and Ancona.

Port facilities.—Water is laid on to the quays. Fresh provisions are procurable. Small repairs can be executed.

There is a hospital.

Directions.—A vessel, coming from north-westward, should make

Charts 2774, 1440, 2158a.

Charts 2775 and 2774, with plans of Port of Zadar.

for Rt Mika (*Lat. 44° 08' N., Long. 15° 12' E.*) and then steer for the south-western edge of Zadar; the entrance to the harbour can be steered for when the dolphin with the mooring post on it, southward of
5 Prima Valle di Maistro, bears 090°, or when the steam mill near Punta Ceraria is in line with the head of Molo Porporella, bearing about 101°.

After entering the harbour, it is recommended that a vessel should have her bows turned seaward so as to facilitate her departure..

Vessels anchoring in the area south-eastward of Molo Porporella,
10 can secure their bows to the mooring buoys there and should keep as near as possible to Riva Barcagno so as not to interfere with the turning movements of vessels near the entrance; care must be taken not to foul the moorings of the buoys.

Charts 2774, 2711.

15 **SREDNJI KANAL.—General description.**—The south-eastern part of Srednji kanal lies between Otok Pašman, on its north-eastern side, and Otok Sit, with the islets off-lying its southern and northern ends, on its south-western side. The north-western part of the channel lies between Otok Uljan, on its north-eastern side, and Otok Iž, on its
20 south-western side, and communicates with the northern waters of the Adriatic by a number of channels. Srednji kanal is little frequented, preference being given, in fine weather, to the passage south-westward of the islands lying off this part of the mainland, and, under other circumstances, to Zadarski kanal.

25 *Chart 2774.*

South-eastern part of channel.—Dangers.—Srednji kanal is entered from south-eastward between Otočić Košara, and Hrid Gali-jolica (Galiola), 6 feet (1^m8) high, about 1½ miles west-south-westward. Otočić Košara, of a yellowish colour and steep-to, is 279 feet (85^m0)
30 high at its south-eastern end, which lies about 2½ cables westward of the western extremity of Otočić Žižanj, page 315.

Otočić Maslinjak, with an above-water rock close south-eastward, lies, midway between Otočić Košara and Otok Pašman, on the end of a spit, with depths of 3 fathoms (5^m5) over it, which extends about
35 half a mile north-westward from the western extremity of Otočić Žižanj (*Lat. 43° 53' N., Long. 15° 25' E.*). For anchorage, *see* page 334.

The south-western side of Otok Pašman is, for the most part steep-to, uninhabited and covered with brushwood.

Uvala Landin (Kruševica) lies on the south-western side of Otok
40 Pašman, about a mile north-north-westward of Otočić Košara. The south-western side of this cove is formed by a peninsula extending south-eastward and connected to the coast by a low isthmus. Otočić Landinić, which is low and difficult to distinguish, lies close off the extremity of this peninsula, and a bank, with a depth of 2 fathoms
45 (3^m7) over it, extends half way across the cove from the north-eastern side of the peninsula, about 1½ cables within the entrance. In the approach to the cove, about three-quarters of a mile south-westward of Otočić Landinić, there are two banks, about 2 cables apart; the south-eastern of these banks has a depth of 8 fathoms (14^m6) over
50 it, and the north-western, 10 fathoms (18^m3). For anchorage, *see* page 334.

Uvala Zinčeva lies on the western side of the peninsula just mentioned.

Charts 1440, 2158a.

Chart 2774.

On the south-western side of the channel, Hrid Galijolica (*Lat.* 43° 53' N., *Long.* 15° 22' E.) is the south-easternmost of a chain of islets extending from the south-eastern end of Otok Sit. About 4 cables south-south-eastward of this rock there is a shoal, with a depth of 2½ fathoms (5^m0) over it, and Greben Miši, with a depth of less than 6 feet (1^m8) over it and a depth of 1½ fathoms (2^m7) close north-eastward, lies about 6 cables west-north-westward of the same rock.

Otočić Bikarijica (Dikovica), 49 feet (14^m9) high, lies about a mile north-westward of Hrid Galijolica. A shoal, with a depth of 2½ fathoms (5^m0) over it, lies about half a mile west-north-westward of Otočić Bikarijica.

Otočić Gangarol, 112 feet (34^m1) high at its north-western end, lies with its south-eastern end about half a mile north-north-westward of Otočić Bikarijica. The north-western end of Otočić Gangarol lies about half a mile south-eastward of the south-eastern end of Otok Sit, with Otočić Šćitna (Sitno), 151 feet (46^m0) high, midway between.

Otok Sit is 276 feet (84^m1) high at its southern end; this island is cultivated on its south-western side and has a boat harbour on the western side of its northern end.

Otočić Balabra Veliki, 95 feet (29^m0) high, lies about 2 cables westward of the north-western end of Otok Sit, and Otočić Balabra Mala, 16 feet (4^m9) high, about half a mile north-north-westward of the same point. Pličina Balabra, with a depth of 2½ fathoms (4^m1) over it, lies about 7 cables west-north-westward of the western end of Otočić Balabra Veliki.

On the north-eastern side of the channel, Uvala Soline is entered between two points, 2 cables apart, about 1½ miles east-north-eastward of the south-eastern end of Otok Sit. There is a boat jetty at the south-eastern end of this cove. For anchorage, *see* page 334.

Uvala Sveti Ante, with a chapel of the same name on its north-eastern side, lies close north-westward of Uvala Soline, separated from it by a small peninsula extending southward. There is a small boat harbour in this cove. For anchorage, *see* page 334.

Uvala Kobiljak and Uvala Čelinja lie about three-quarters of a mile and 1½ miles, respectively, north-westward of Uvala Sveti Ante. Both these coves are exposed to the Scirocco, which causes a heavy sea.

Rt Rasovica (Brosovica) is situated about 1½ miles east-north-eastward of Otočić Balabra Mala.

Uvala Čerenje, at the head of which there are two jetties, forming a small boat harbour, is situated about 1½ miles north-north-westward of Rt Rasovica. For berthing, *see* page 334.

Bokolj, 900 feet (274^m3) high, the summit of Otok Pašman, stands about 6 cables north-eastward of the head of Uvala Čerenje.

Uvala Kablin lies about 3½ miles north-westward of Rt Rasovica; 45 in the southern part of this cove, there is a boat jetty. For anchorage, *see* page 334.

North-westward of Otok Sit, Srednji kanal widens; Otok Laudara lies 4 miles off the south-western coast of Otok Pašman, with its north-western extremity about 3½ miles west-north-westward of Otočić Balabra Veliki. Otok Laudara is 285 feet (86^m9) high and steep-to on its north-eastern side. It is barren except for some patches of grass.

A rock, with a depth of 6 feet (1^m8) over it, lies about 4 cables westward of the north-western extremity of Otok Laudara, in the channel

Charts 1440, 2158a.

Chart 2774.

between it and Otočić Mrtenjak, 72 feet (21^m9) high, situated about three-quarters of a mile north-westward of the same extremity. A rock, with a depth of less than 6 feet (1^m8) over it, lies on the end of a spit which extends about 2 cables north-north-westward from the northern end of Otočić Mrtenjak.

Otočić Tukošćak, 92 feet (28^m0) high, lies about 4 cables north-westward of Otočić Mrtenjak. A spit, with a depth of 6 feet (1^m8) over its outer end, extends about a cable from the southern side of Otočić Tukošćak; a 4½-fathom (8^m7) patch lies about half a mile eastward, and a 3½-fathom (6^m9) patch lies about 7 cables north-westward, of this islet.

Lights.—A light is exhibited, at an elevation of 39 feet (11^m9), from a red conical iron tower, 25 feet (7^m6) in height, on the south-western side of Otočić Košara (*Lat.* 43° 53' N., *Long.* 15° 24' E.).

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column, 10 feet (3^m0) in height, on the north-western extremity of Otok Laudara.

Anchorage.—Between Otok Pašman and the spit extending north-westward from Otočić Žižanj, there is tolerably sheltered anchorage for small vessels, in depths of from 6 to 12 fathoms (11^m0 to 21^m9).

In Uvala Landin, there is good anchorage during a Bora; the cove is exposed to the Scirocco, which causes a heavy sea. A vessel should anchor off the north-eastern side, near a hut and jetty, securing to the rocks ashore. In the western part of the cove, there is a small boat harbour.

Uvala Soline affords good shelter in its south-eastern part from all winds, in a depth of about 9 fathoms (16^m5), sand and gravel, good holding ground; a hawser should be secured to the shore in a Bora. The bottom is rocky in the middle of the cove.

Uvala Sveti Ante affords shelter to medium sized vessels in all ordinary winds; the best anchorage is westward of the chapel, where the bottom is sand and gravel, good holding ground.

In Uvala Čerenje, small vessels can secure alongside the south-eastern jetty.

Uvala Kablin affords shelter from the Bora over a bottom of sand.

North-western part of Srednji kanal.—The south-eastern end of this part of Srednji kanal is entered between Otočić Karantunić, 59 feet (18^m0) high, lying close off the southern extremity of Otok Uljan, to which it is connected by a shallow bank, and Rt Parda, the south-eastern extremity of Otok Iž, about 3 miles west-south-westward.

Prolaz Ždrelac, the narrow passage between Otok Pašman and Otok Uljan is described on page 322.

The south-western side of Otok Uljan is wooded and sparsely inhabited. Suhi rt lies about half a mile northward of Otočić Karantunić.

Between Suhi rt and Rt Japlenička (Zapleniska), 2 miles north-westward, there is a bight in which there are some islets and shoals, and the shores of which are indented. Otočić Bisage (Veli skolj), 62 feet (18^m9) high, lies midway between the entrance points of the bight, with a 3½-fathom (6^m9) patch about 1½ cables eastward of it; Otočić Školj Veliki (Pohlib), 194 feet (59^m1) high, with a shallow bank extending a short distance from its north-western side, lies about 4 cables east-south-eastward of Rt Japlenička; a 3½-fathom

Charts 1440, 2158a.

Chart 2774.

(6^m4) patch lies about 1½ cables south-eastward, and a 2½-fathom (4^m1) patch lies about 3½ cables east-north-eastward of this islet; Otočić Golac, 62 feet (18^m9) high, lies about 3½ cables north-eastward of Otočić Bisage, and is connected to the coast eastward by a bank, 5 with a depth of 4½ fathoms (7^m8) over it, about a cable wide.

Uvala Sabušica is situated at the south-eastern end of the bight just mentioned. A bank, with a depth of 4½ fathoms (7^m8) over its outer end, extends about 2 cables north-westward from Suhi rt and the shores of the cove are bordered by a bank which is about a cable 10 wide at its south-eastern end. There are some boat jetties in the cove. For anchorage, *see* page 338.

Uvala Lamjana Vela and Uvala Lamjana Mala divided by a promontory, lie at the north-western end of the bight. An above water rock lies close off the south-western entrance point of Lamjana Vela, 15 the western of these two coves, about 4 cables north-eastward of Rt Japlenička. For anchorage, *see* page 338.

On the south-western side of Srednji kanal, the north-eastern side of Otok Iž is cultivated; Korinjak, the summit of this island, is 551 feet (167^m9) high and is situated about 2 miles from its north- 20 western end. The north-eastern side of the island is indented and several islets lie off it. Otočić Dragovešćak and Otočić Tomešnjak, both 72 feet (21^m9) high, lie about a mile north-north-eastward and three-quarters of a mile north-north-westward, respectively, of Rt Parda, the latter, at a distance of about 2 cables offshore. Rt Arta 25 (Arat) lies about 1½ miles north-north-westward of Rt Parda (*Lat.* 44° 00' N., *Long.* 15° 10' E.).

Uvala Vodenjak Veli is situated 4 cables southward, and Uvala Bršanj (Beršan), 2½ cables north-westward, of Rt Arta. Uvala Komaševa, where there is a mole forming a small harbour, lies about 30 three-quarters of a mile north-westward of Rt Arta; a church with a conspicuous belfry stands about 3½ cables westward of the head of this cove. The local steamer calls here.

Uvala Knež, sheltered from all winds except the Bora, and in which there are some jetties, lies about half a mile west-north-westward of 35 Uvala Komaševa. The local steamer calls here. For anchorage, *see* page 338.

Otočić Knežak, 207 feet (63^m1) high, lies, with its south-eastern end, about a mile north-westward of Rt Arta, connected to the coast of Otok Iž by a narrow bank, over which there is a passage, with a depth 40 of 2 fathoms (3^m7) in the fairway. For anchorage, *see* page 338.

Danger.—Beacon.—A sunken rock, marked by a white beacon, 10 feet (3^m0) high, lies about 2½ cables north-north-westward of Otočić Knežak and 3½ cables offshore.

Channel.—Otočić Rutnjak, 56 feet (17^m1) high, lies about three- 45 quarters of a mile north-westward of Otočić Knežak. The southern entrance point of the harbour of Iž Veli lies about 3½ cables westward of Otočić Rutnjak.

The harbour of Iž Veli is sheltered from all winds, but winds from the eastern semicircle cause some swell. There is a masonry quay for 50 the local steamer and two small basins for fishing craft at the head of the harbour. The village of Iž Veli, at the head of the harbour, contained 1,860 inhabitants, in 1931.

Telegraph cable.—A submarine cable, indicated on the chart,

Charts 1440, 2158a.

Chart 2774.

is laid across Srednji kanal from Iž Veli to Uvala Željina, about 2 miles north-eastward. A cable house marks each end of this cable ; anchorage is prohibited in the vicinity of the cable.

- 5 **Channel.**—On the north-eastern side of Srednji kanal, Rt Zaglav lies about $5\frac{1}{2}$ miles north-westward of Rt Japlenička. A shoal, with a depth of $3\frac{1}{2}$ fathoms (6^m9) over it, lies about a mile south-eastward of Rt Zaglav and $1\frac{1}{2}$ cables offshore. From abreast this shoal, south-eastward to Rt Japlenička, the south-western side of Otok Uljan is precipitous and steep-to.

Uvala Prkljuk, which is shallow, lies eastward of Rt Zaglav. There is a boat jetty in this cove. For anchorage, *see* page 338.

- On the south-western side of the channel, Uvala Maslinčica, with the village of Drage at its head, lies about 3 cables north-westward of 15 Iž Veli. There are a quay and some jetties, forming a boat harbour, in this cove.

- Uvala Dumboka and Uvala Peščenice lie about three-quarters of a mile and $1\frac{1}{2}$ miles, respectively, north-westward of Uvala Maslinčica. The former is exposed north-eastward and has a boat jetty in it ; the 20 latter is exposed northward and has two small jetties, in shallow water, at its head.

- Uvala Šipnate is situated about 3 cables south-eastward of Rt Osiljenac, the north-western extremity of Otok Iž (*Lat.* $44^{\circ} 05' N.$, *Long.* $15^{\circ} 04' E.$). This cove is exposed north-eastward and there are 25 a breakwater and some jetties at its head.

Charts 2774, 2711.

- Northward of Otok Iž, Srednji kanal widens ; Iški kanal and Ravski kanal, page 348, are entered from north-westward between Rt 30 Osiljenac and Rt Kamik, on the north-eastern side of Dugi otok, about $2\frac{1}{2}$ miles westward.

- Dangers.**—A shoal, with a depth of 5 feet (1^m5) over it, lies about 6 cables north-westward of Rt Osiljenac, with a $3\frac{1}{2}$ -fathom (6^m9) patch nearly midway between ; another shoal, with a depth of 5 feet (1^m5) over it, lies about $1\frac{1}{2}$ miles west-north-westward of the same 35 point. There is a $5\frac{1}{2}$ -fathom (10^m1) patch 2 cables south-eastward of this shoal. The 5-foot (1^m5) shoals can be distinguished at a short distance by the brownish colour of the water.

Chart 2774.

- Channel.**—On the north-eastern side of Srednji kanal, Rt Kobiljak 40 lies 6 cables west-north-westward of Rt Zaglav, and Rt Dražica (Čuča), with an above-water rock close off it, lies about $1\frac{1}{2}$ miles farther north-westward. This stretch of coast is fringed by a bank, with depths of less than 5 fathoms (9^m1) over it, about $1\frac{1}{2}$ cables wide ; there is an above-water rock on this bank, close offshore, about $2\frac{1}{2}$ 45 cables north-westward of Rt Zaglav. Sveti Kuzma chapel, about 4 cables south-eastward of Rt Dražica is conspicuous.

There are some jetties in Uvala Pavlešina, situated on the north-western side of Rt Dražica.

- Rt Ovčjak (Orčak), the north-western extremity of a peninsula, 50 154 feet (46^m9) high, lies about a mile north-westward of Rt Dražica. Uvala Muline lies close north-eastward of Rt Ovčjak, with the village of the same name at its head. There are some jetties off the village. For anchorage, *see* page 338.

Veli Ždrelec, page 326, is entered from south-westward between

Charts 1440, 2158a.

Chart 2774.

Rt Ovčjak and the south-eastern end of Otok Rivanj, and Rivanjski kanal, page 349, is entered from south-eastward between the latter point and the south-eastern end of Otok Sestrunj, about $1\frac{1}{2}$ miles south-westward.

Chart 2711.

On the south-western side of Srednji kanal, Rt Kamik (*Lat.* $44^{\circ} 05' N.$, *Long.* $15^{\circ} 00' E.$) lies on the north-eastern side of a peninsula, 374 feet (114^m0) high, extending about three-quarters of a mile north-westward. Uvala Lučina, the head of which is shallow, lies on the 10 western side of this peninsula. Otočić Školjić (Utran), 157 feet (47^m9) high, divides the entrance to this cove into two channels; there are depths greater than 7 fathoms (12^m8) in the fairway of the passage eastward of the islet, and a depth of $5\frac{1}{2}$ fathoms (9^m6) in the fairway of the passage between the islet and the western entrance point of 15 the cove. A rocky patch, with a depth of $4\frac{1}{2}$ fathoms (8^m2) over it, lies about 4 cables north-westward of Otočić Školjić. The village of Zaglava lies at the head of Uvala Lučina, where there are a mole and some jetties. For anchorage, *see* page 338.

Otočić Tatišnjak (Tališnjak), 26 feet (7^m9) high, lies about $1\frac{1}{2}$ miles 20 north-westward of Otočić Školjić and 4 cables offshore. Uvala Bokašin lies about three-quarters of a mile west-north-westward of Otočić Tatišnjak. There is a boat jetty in this cove. For anchorage, *see* page 338.

Otočić Planatak Veliki, 56 feet (17^m1) high, with Otočić Planatak 25 Mali, 23 feet (7^m0) high, close southward, lies about a cable off a point situated half a mile north-eastward of the head of Uvala Bokašin. There is a depth of 6 feet (1^m8) in the passage between these two islets.

Between Uvala Lučina and Uvala Bokašin, the north-eastern side of Dugi otok rises steeply; Zlatni Vrh, 774 feet (235^m9) high, stands about 30 $2\frac{1}{2}$ miles north-westward of Zaglava and a quarter of a mile inland.

Zverinački kanal, page 351, is entered between Otočić Planatak Veliki and Južni (Južnja) rt, the south-eastern extremity of Otok Zverinac, about $1\frac{1}{2}$ miles northward. Tanski kanal, page 351, is entered between Južni rt and Rt Veli Bok, the south-eastern extremity of Otok Tun Veli. Sestrunjski kanal, page 350, is entered between Rt Veli Bok and Rt Kuzmino, on the south-western side of Otok Sestrunj, about $1\frac{1}{2}$ miles east-south-eastward.

Chart 2774.

Lights.—A light is exhibited, at an elevation of 103 feet (31^m4), 40 from a red conical iron tower, 23 feet (7^m0) in height, on Otočić Karantunić (*Lat.* $44^{\circ} 01' N.$, *Long.* $15^{\circ} 14' E.$).

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column on a stone base, 17 feet (5^m2) in height, on Rt Arta.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron 45 column, 16 feet (4^m9) in height, on the molehead at Uvala Komaševa.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column on a stone base, 20 feet (6^m1) in height, on the southern entrance point of the harbour of Iž Veli.

Chart 2711.

A light is exhibited, at an elevation of 31 feet (9^m4), from a pyramidal iron framework structure, 15 feet (4^m6) in height, on Rt Koromašnjak the northern entrance point of Uvala Brbinj, situated half a mile southward of Rt Kamik.

Charts 1440, 2158a.

Chart 2774.

Anchorage.—Uvala Sabušica affords good anchorage during either a Bora or Scirocco; the bottom is sand.

Uvala Lamjana Mala is sheltered from all winds, but southerly and south-easterly winds cause a swell. Vessels should anchor near the head of the cove.

In Uvala Knež, small vessels can anchor with their bows heading east-north-eastward and their sterns secured to the outer jetty.

Small vessels can anchor either north-westward or south-eastward of the bank connecting Otočić Knežak with Otok Iž, over a bottom of sand.

Uvala Prkljuk affords temporary shelter to small vessels with winds from the northern semicircle; south-easterly winds cause a swell.

Vessels of medium size can anchor in Uvala Muline, well sheltered from wind and sea; the head of this cove is shallow.

Chart 2711.

Uvala Lučina affords good anchorage for vessels of moderate size, in depths of from 7 to 8 fathoms (12^m8 to 14^m6), sand, in its northern part; small vessels, with local knowledge, can anchor nearer to Zaglava, or secure to the head of the mole.

There is good anchorage westward of Otočići Planatak.

Small vessels can anchor in Uvala Bokašin during south-westerly winds, over a bottom of sand.

Chart 2774.

Directions.—In the south-eastern part of Srednji kanal, between Otok Pašman and Otok Kornat, the middle of the channel is so encumbered with islets, rocks and shoals as to make it not very suitable for navigation; south-eastward of Otok Iž, the passage for a vessel is along the coast of Otok Pašman, between it and Otok Sit, and the eye and chart should be the guide.

Between Otok Iž and Otok Uljan the only hidden danger is a sunken rock, marked by a beacon, situated about 3½ cables from the coast of Otok Iž and 2½ cables north-north-westward of Otočić Knežak, see page 335.

Charts 1561, 2711, 2774.

For a vessel approaching from the westward by Prolaz Maknare, page 374, which lies between the south-western end of Otok Molat and Otočić Golac (*Lat.* 44° 11' N., *Long.* 14° 51' E.) off the northern end of Dugi otok, there are three passages into Srednji kanal:—The first, Zverinački kanal, lies between the northern end of Dugi otok and Otok Zverinac; in taking this passage Otok Zverinac should be kept close aboard at the northern entrance to avoid the shoals extending to mid-channel off the coast of Dugi otok. The second passage, Tunski kanal, is between Otok Zverinac and Otok Tun Veli; this channel is deep and clear of dangers. The third passage, Sestrunjski kanal, which is wide and clear of dangers, lies between Otok Tun Veli and Otok Sestrunj.

Entering Srednji kanal from Kvarnerić, either of the three passages just described may be used as well as a fourth, Rivanjski kanal, which lies between Otok Sestrunj and Otočići Tri Sestrice and Otok Rivanj (see page 349). There is also Veli Ždrelac, a narrow passage with a depth of 4½ fathoms (8^m7) in it, between Otok Rivanj and the north-western end of Otok Uljan, through which a strong current occasionally sets.

Charts 1440, 2158a.

Chart 2774.

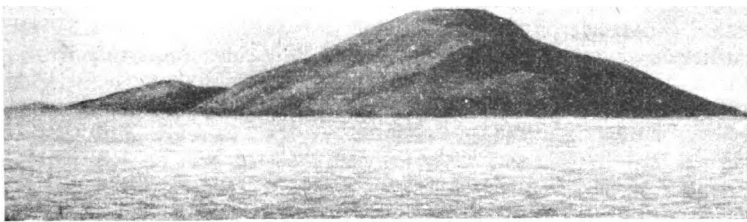
ŽUTSKI KANAL.—South-eastern approach.—Dangers.—Žutski (Žut) kanal, which lies between Otok Žut, on its north-eastern side, and Otok Kornat, on its south-western side, is approached from south-eastward along the north-eastern side of the south-eastern end of Otok Kornat and the islets and dangers lying between that island and Otok Žirje, page 304. 5

Rt Opat, the south-eastern extremity of Otok Kornat, lies $3\frac{1}{2}$ miles north-westward of Otočić Mrtovnjak, page 305. Otočić Babina Guzica, 59 feet (18^m0) high, lies about $1\frac{1}{2}$ miles westward of Otočić Mrtovnjak; a rock, with a depth of less than 6 feet (1^m8) over it, lies westward, and a shoal, with a depth of 2 fathoms (3^m7) over it, lies north-westward, both at a distance of 3 cables, from Otočić Babina Guzica. 10

Otočić Smokvica Vela, 305 feet (93^m0) high and partially cultivated, lies about $3\frac{1}{2}$ cables south-eastward of Rt Opat. Uvala Lojena lies on the southern side of this islet. A shoal, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it, lies in the approach to the cove, about $2\frac{1}{2}$ cables south-south-westward from its eastern entrance point. For anchorage, see page 341. 15

Otočić Smokvica Mala, 23 feet (7^m0) high, lies close off the south-eastern extremity of Otočić Smokvica Vela. A rock, with a depth of less than 6 feet (1^m8) over it, and which breaks, lies about $3\frac{1}{2}$ cables east-south-eastward, and a shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, lies about the same distance north-eastward, of Otočić Smokvica Mala. A shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, lies about 2 cables off the north-eastern side of Otočić Smokvica Vela; and a shoal, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, lies about a cable off the north-western extremity of the same islet (*Lat. $43^{\circ} 44'$ N., Long. $15^{\circ} 28'$ E.*). 20

Rt Opat is the north-eastern extremity of a hill of the same name which is 358 feet (109^m1) high. There is a conspicuous statue on the southern extremity of the hill. Uvala Opat lies on the south-western side of Opat hill; a shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, 25



Opat hill.

Original dated prior to 1919.

lies about $1\frac{1}{2}$ cables southward of the western entrance point of this cove. For anchorage, see page 342. 30

Otok Kornat, at a distance, appears as a range of whitish, conical

Charts 1440, 2158a.

Chart 2774.

hillocks. Veli Vrh, the summit, 771 feet (234^m9) high, stands about 4 miles from the north-western end of the island.

Žutski kanal is entered from south-eastward, between a point on the coast of Otok Kornat about 4 cables eastward of Bikarica, a hill, 505 feet (155^m9) high, which stands about 4½ miles north-westward of Rt Opat, and Otočić Kamenar, which lies close off the south-eastern end of Otok Žut, 2½ miles northward. A shoal, with a depth of 2½ fathoms (5^m0) over it, and steep-to, lies about half a mile east-
10 south-eastward of Otočić Kamenar.

This entrance is encumbered with a group of islets and rocks; Otočić Dajne Veliki, 151 feet (46^m0) high, the largest of these islets, lies about 6 cables south-westward of Otočić Kamenar and the same distance off the coast of Otok Kornat. Otočić Brusna (Brušnjak),
15 23 feet (7^m0) high, with a 3½-fathom (5^m9) patch 1½ cables west-south-westward of it, lies about half a mile south-eastward of Otočić Dajne Veliki. Hrid Kalafatin, one foot (0^m3) high, lies about three-quarters of a mile north-westward of the same islet. The positions of the remaining islets of the group can best be seen on the chart.

20 From Rt Opat (*Lat.* 43° 44' N., *Long.* 15° 28' E.) to the head of Uvala Statal (Slatival), 11½ miles north-westward, the north-eastern side of Otok Kornat falls steeply to the sea and is steep-to; the lower slopes are covered with trees.

On the north-eastern side of the channel, Otok Žut is hilly and
25 stony, its summit, 577 feet (175^m9) high, is situated about 4 miles from its south-eastern end and a short distance inland from its south-western side. The island is covered with bushes, grass and scanty cultivation and is sparsely inhabited. The salient points of this island should be given a wide berth.

30 On the south-western side of the channel, Uvala Statal is situated on the south-eastern side of a promontory, 279 feet (85^m0) high, extending eastward from Otok Kornat. This bay is divided into two by a projection; there is a boat harbour in the south-western bay. Otočić Svršata Veliki, 118 feet (36^m0) high, lies close south-eastward of
35 the north-eastern entrance point of Uvala Statal, connected by a bank with a depth of 3½ fathoms (6^m9) over it; Otočić Svršata Mala, 59 feet (18^m0) high, lies about 2 cables eastward of the southern end of the larger islet. A shoal, with a depth of 4 fathoms (7^m3) over it, lies in the approach to Uvala Statal, midway between the south-
40 eastern end of Otočić Svršata Veliki and the coast of Otok Kornat; another shoal, with a depth of 4½ fathoms (7^m8) over it, lies 3½ cables west-north-westward of this shoal and 2½ cables off Otok Kornat.

On the north-eastern side of the channel, a shoal, with a depth of 2½ fathoms (5^m0) over it, lies about 6 cables north-north-eastward of
45 Otočić Svršata Veliki and 1½ cables off the coast of Otok Žut.

Žutski kanal is entered from north-westward between the northern extremity of Otok Kornat and the north-western extremity of Otok Žut, about a mile east-north-eastward. Otočić Buč Veliki, 144 feet (43^m9) high at its northern end, lies close off the northern extremity of
50 Otok Kornat and Otočić Buč Mala lies about 3 cables north-eastward of the same point; Hrid Kamičić, 2 feet (0^m6) high, lies about a cable south-eastward of this islet, and a shoal, with a depth of 3½ fathoms (6^m8) over it, lies about 2 cables farther south-eastward and one cable off the coast of Otok Kornat.

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Chart 2774, with plan of Port Tajer.

North-western approach to Žutski kanal.—Beacons.—A number of islets and dangers lie in the north-western approach to Žutski kanal; Otočić Katina (Verige), the largest of these islets, 384 feet (117^m0) high, lies midway between Otok Kornat and Dugi 5 otok, separated from the former by Prolaz Proversa Veliki (Velike Verige) and from the latter by Prolaz Proversa Mala. The southern and larger of these two passages has a depth of 7 feet (2^m1) in the fairway and can be used by small vessels with local knowledge. The passage is marked by two pairs of stone pyramidal beacons painted 10 with black and white stripes, erected on Otok Kornat, forming leading marks; the extremities of the shallowest part of the channel are marked by red and white paint on the rocks on the coast of Otočić Katina. The current in the channel is normally in the direction contrary to the wind, but during a change of wind it sometimes attains 15 a rate of from 3 to 4 knots.

Prolaz Proversa Mala is very narrow and is only suitable for boats.

Luka Proversa, the shores of which are steep-to, lies between Otočić Katina and Otočić Buč Veliki; a rock, 10 feet (3^m0) high, lies about 2 cables westward of the northern end of the latter islet and about 20 1½ cables farther south-westward, there is a reef marked by a square stone beacon, 10 feet (3^m0) high (*Lat.* 43° 53' N., *Long.* 15° 14' E.). For anchorage, see page 342.

Otočić Gornja Aba, 246 feet (75^m0) high, lies in the northern approach to Luka Proversa, about 2 cables north-eastward of Otočić Katina; 25 an above-water rock lies a short distance off the south-eastern end of the former islet.

Uvala Čušćica, at the head of which there is a boat jetty, is situated at the south-eastern end of Dugi otok, between Rt Čuška, the south-eastern extremity of that island, and the north-eastern entrance point 30 of Prolaz Proversa Mala, 4½ cables south-westward. A bank, with a depth of 3½ fathoms (6^m4) over it, extends about a cable off Rt Čuška. For anchorage, see page 342.

Chart 2774.

Otočić Breskvenjak, 112 feet (34^m1) high, lies about 2½ cables off the 35 north-western extremity of Otok Žut. Uvala Pinizel is situated at the north-western end of Otok Žut between the north-western extremity of that island and Otočić Pinizelić, 33 feet (10^m1) high, about 3½ cables eastward; this islet is connected to the coast of Otok Žut by a shallow bank. The village of Pinizelić, which is only occupied in 40 summer and where there is a boat harbour, is situated on the eastern side of this cove.

Otočić Glamoč (Glavoč), 174 feet (53^m0) high, lies about 2 cables north-westward of Otočić Pinizelić, and Otočić Trstikovac, 52 feet (15^m8) high, lies about 2 cables off the northern end of Otočić Glamoč. 45 Otočići Trimulići, the eastern of which is 13 feet (4^m0) high and the western, 26 feet (7^m9) high, lie about a cable north-westward and 2½ cables west-north-westward, respectively, of Otočić Trstikovac.

Otočić Laudara Mala, 92 feet (28^m0) high, lies 7 cables north-westward of the western of Otočići Trimulići and the same distance off 50 the coast of Dugi otok, south-westward.

Anchorage.—There is anchorage, during a Bora, in Uvala Lojena, page 339; the bottom is sand with some weed.

There is good anchorage for small vessels, during a Bora, on the

Charts 1440, 2158a.

Chart 2774.

north-eastern side of the entrance to Uvala Opat, or near the head of the cove with hawsers secured ashore. The Scirocco causes a heavy sea.

- 5 Small vessels can anchor in Luka Proversa either in the cove north-westward of the beacon in the harbour or, in a Bōra, eastward of the beacon, under Otočić Buč Veliki. The bottom is sand, good holding ground.

Chart 2774, plan of Port Tajer.

- 10 There is good anchorage for small vessels, in all winds, in Uvala Čušćica; the bottom is sand and shells, good holding ground.

Chart 2774.

- Directions.**—A vessel proceeding through Žutski kanal from south-eastward, if coming from the vicinity of Otočić Blitvenica, should
15 follow the directions given on page 307. After passing northward of Otočić Mrtovnjak and the dangers off-lying Otočić Smokvica Mala, page 339, she should keep near Otok Kornat until past the group of islets in the entrance to the channel. Thence she should steer in mid-channel, passing north-eastward of Otočić Svršata Mala and between
20 Otočić Gornja Aba, on the western side, and Otočić Breskvenjak (*Lat.* 43° 53' N., *Long.* 15° 15' E.), on the eastern side.

- Approaching from north-westward, a vessel should steer for Otočić Laudara Mala and pass eastward of that islet. On a nearer approach, the olive groves, on Otok Kornat, will be sighted south-eastward of
25 Hrid Kamičić.

SITSKI KANAL.—General description.—Sitski kanal separates Otok Žut from Otok Sit and the islets and rocks extending south-eastward from the latter island, page 333.

- This channel is so encumbered with islets, rocks, and dangers as
30 to make it unsuitable for navigation without local knowledge.

- Channel.—Islets and dangers.**—Sitski kanal is entered from south-eastward between Otočić Kamenar, page 340, and Hrid Galijolica, page 332, about 3½ miles northward. Otočić Žutska Aba, 236 feet (71^m9) high, lies north-eastward of the south-eastern end of
35 Otok Žut, separated by a narrow channel, in the fairway of which there is a depth of 4½ fathoms (8^m7). For anchorage, *see* page 344.

- Otočić Blitvica, 46 feet (14^m0) high, and composed of white rock, lies 3½ cables eastward of Otočić Žutska Aba. Hridi Dinarići (Dajnice), the south-eastern of which is 30 feet (9^m1) high and the north-western,
40 10 feet (3^m0) high, lie, about a cable apart, on a bank situated about three-quarters of a mile northward of Otočić Žutska Aba; Greben Dinarići, with a depth of less than 6 feet (1^m8) over it, lies about 2½ cables eastward of these rocks.

- Hrid Sandela, 3 feet (0^m9) high, lies about a mile south-south-westward of Hrid Gajolica and the same distance off the coast of Otok Žut. Otočić Ravna Sika, 20 feet (6^m1) high, lies about 4 cables north-north-westward of Hrid Sandela.

- Otočići Babuljaši, the south-eastern of which is 33 feet (10^m1) high, and the north-western, 23 feet (7^m0) high, lie about 3 cables northward
50 and 5 cables north-north-westward, respectively, of Otočić Ravna Sika.

The 2½-fathom (5^m0) patch, 4 cables south-south-eastward of Hrid Gajolica, and Greben Miši, 3½ cables east-north-eastward of the north-western of Otočići Babuljaši, are mentioned on page 333.

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Chart 2774.

On the south-western side of the channel, Rt Strunac, the northern termination of a projection extending from the north-eastern side of Otok Žut, is situated about 4 miles north-westward of Otočić Žutska Aba; a sunken rock lies close offshore, about 4 cables south-south-eastward of this point. Uvala Hiljača is entered between a point about a mile south-eastward of Rt Strunac and a point half a mile farther southward. The village of Sabuni lies at the head of a cove at the north-western end of this bay and the village of Pristanisce is situated on the southern side of the bay; each of these villages has a boat harbour.

Uvala Hiljača is sheltered from north-easterly winds by Otočić Gustac, 141 feet (43^m0) high, the southern end of which is connected to the northern entrance point of the bay by a bank, with a depth of 4½ fathoms (8^m7) over it, about a cable wide. Otočić Tovarnjak, 98 feet (29^m9) high, lies about 1½ cables north-eastward of the northern entrance point of Uvala Hiljača, connected to it by a bank, with a depth of 4 fathoms (7^m3) over it; nearly midway between this islet and the north-western of Otočići Babuljaši there is a shoal, with a depth of 4½ fathoms (7^m8) over it.

Otočić Bisage Veliki (*Lat.* 43° 52' N., *Long.* 15° 20' E.), with Otočić Bisage Mala 2 cables south-south-eastward of it, lies about 1½ cables south-eastward of Otočić Gustac; a 1½-fathom (2^m7) patch lies midway between the south-western end of the larger of these two islets and the smaller islet. For anchorage, see page 344.

A shoal, with a depth of 2 fathoms (3^m7) over it, lies about 3 cables north-north-eastward of Rt Strunac; the 2½-fathom (5^m0) patch, about a mile east-north-eastward of Rt Strunac, is mentioned on page 333.

Luka Žut, the shores of which are cultivated with olive groves and vineyards, is entered between Rt Strunac and the eastern extremity of a peninsula, about 8 cables westward; Otočić Maslinjak (Manjak), 49 feet (14^m9) high, lies in this entrance, about 2 cables westward of Rt Strunac. In Luka Žut there are several coves, each of which has a boat harbour, and which afford shelter for small craft. The Bora, generally from an easterly direction, blows strongly but does not cause an appreciable sea. Uvala Golubovac is situated in the north-western part of the harbour, and Uvala Saruščica, in the south-eastern part. For anchorage, see page 344.

Hrid Did, 23 feet (7^m0) high, from which a bank, with a depth of less than 5 fathoms (9^m1) over it, extends a short distance south-westward, lies about half a mile north-north-westward of Otočić Maslinjak, and Hrid Baba, 10 feet (3^m0) high, lies about 4 cables farther north-north-westward; a shoal, with a depth of 3½ fathoms (6^m9) over it, lies about 2 cables eastward of Hrid Did.

Otočić Ravna Sika (Vrtljač), 20 feet (6^m1) high, lies near the middle of a shallow bank situated from 3 to 6 cables north-westward of Hrid Baba.

On the north-eastern side of the channel, a sunken rock lies about 3 cables southward of Otočić Ščitna, page 333.

On the south-western side of the channel, Uvala Bizikovica, the entrance to which is about half a mile wide, lies near the north-western end of Otok Žut. Small craft will find good shelter along the eastern shore of this cove; hawsers can be secured to rocks ashore. On the western side of the cove there is a boat harbour.

Charts 1440, 2158a.

Chart 2774.

Depths of less than 5 fathoms (9^m1) extend about a cable offshore a short distance eastward of the northern extremity of Otok Žut. Hrid Krbarić (Golubnjak), 13 feet (4^m0) high, lies about 3 cables north-westward of the northern extremity of Otok Žut and the same distance off Otočić Glamoč. A narrow bank, about 2 cables long, lies with its south-eastern end, over which there is a depth of 2 fathoms (3^m7), about $1\frac{1}{2}$ cables north-eastward of Hrid Krbarić. Another bank, with a least depth of $1\frac{1}{2}$ fathoms (2^m7) over it, about 3 cables long, lies about 2 cables off the north-eastern side of Otočić Glamoč; there is a depth of about 8 fathoms (14^m6) between these two banks.

Otočić Rončić (Sonsic), 23 feet (7^m0) high, lies about 7 cables north-eastward of Hrid Krbarić; a shoal, with a depth of $3\frac{1}{2}$ fathoms (6^m9) over it, lies about $2\frac{1}{2}$ cables north-north-eastward of this islet (*Lat.* $43^\circ 54' N.$, *Long.* $15^\circ 16' E.$).

Otočić Skala Veliki, 59 feet (18^m0) high, lies about 4 cables north-eastward of the eastern of Otočići Trimulići, page 341. Otočić Skala Mala, 33 feet (10^m1) high, lies about $1\frac{1}{2}$ cables off the south-eastern end of the larger islet, to which it is connected by a bank with a depth of 2 fathoms (3^m7) over it. Both these islets are flat and light coloured. A bank, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, extends about a cable eastward from the northern end of Otočić Skala Veliki; and a $4\frac{1}{2}$ -fathom (8^m2) patch lies about 2 cables farther east-south-eastward.

Otočić Kurba Mala, which has two peaks, the eastern being 144 feet (43^m9) high, and the western 128 feet (39^m0) high, lies about 3 cables northward of Otočić Skala Veliki. Otočić Božikovac, 33 feet (10^m1) high, lies about 4 cables north-westward of Otočić Kurba Mala, and Otočić Brušnjak, 128 feet (39^m0) high, lies about 3 cables eastward of the same islet. A rock, 7 feet (2^m1) high, lies on the outer end of a shallow bank situated from half a cable to $2\frac{1}{2}$ cables off the north-western side of Otočić Brušnjak.

Otočić Borovnik, 85 feet (25^m9) high, and conspicuous because it is covered with bushes and is of a dark green colour, in contrast to most of the islets in the vicinity, lies close north-eastward of Otočić Brušnjak, to which it is connected by a shallow bank with an above-water rock on it. Otočić Borovnik lies a short distance off the coast of Otok Sit, to which it is connected by a bank, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it.

Anchorages.—There is anchorage for small vessels in the channel between Otok Žut and Otočić Žutska Aba, over a bottom of sand. The best anchorage is in mid-channel with the stern secured to the north-eastern shore. South-easterly winds blow strongly but do not cause a heavy sea.

Vessels can anchor in Uvala Hiljača, under Otočić Gustac, during a Bora; in a Scirocco, there is better shelter off Pristanišće. The bottom is sand and, during bad weather, this bay is not recommended as an anchorage.

Vessels can anchor in the south-eastern part of Luka Žut, in depths of from 19 to 23 fathoms (34^m7 to 42^m1), sheltered from all winds.

Directions.—A vessel entering Sitski kanal from the south-eastern part of Srednji kanal should pass either between Otočić Bikarijica, page 333, on the southern side, and Otočić Gangarol, on the northern side, or between Otočić Ščitna (*Lat.* $43^\circ 55' N.$, *Long.* $15^\circ 20' E.$), on the south-eastern side, and Otok Sit, on the north-western side.

Charts 1440, 2158a.

Chart 2774.

A vessel approaching from north-westward, should pass between Otočić Kurba Mala, on the northern side, and Otočić Skala Veliki, on the southern side.

If entering from the north-western end of Žutski kanal, a vessel should pass southward of Otočić Glamoč. Within the channel, the chart is the best guide.

Chart 2774, with plan of Port Tajer.

LAUDARSKI KANAL.—General description.—Laudarski kanal lies between Otok Laudara, page 333, and the north-eastern side of 10 Dugi otok. There is a house and an olive grove on the south-western side of Otok Laudara. The south-western side of the channel is indented and some islets lie off the coast of Dugi otok in the approach to the north-western end of the channel.

Laudarski kanal is entered from south-eastward between Rt 15 Čuška (*Lat. 43° 54' N., Long. 15° 13' E.*), page 341, and Otočić Laudara Mala, about 1½ miles northward. Uvala Rašovac and Uvala Dumboka are situated on the south-western side of the channel, about 1½ and 2½ miles, respectively, north-westward of Rt Čuška. Uvala Škrovada is situated on the north-eastern side of the channel, at the south- 20 eastern end of Otok Laudara.

Chart 2774.

Rt Blud, the south-eastern extremity of a peninsula, is situated on the coast of Dugi otok about 1½ miles south-westward of the northern extremity of Otok Laudara. A shoal, with a depth of 6 fathoms (11^m0) 25 over it, lies about 3 cables south-eastward of Rt Blud and 2 cables offshore.

Uvala Sali lies on the south-western side of Rt Blud. There are a mole, some jetties and a quay at the head of this bay and also some slipways for boats. The mole is generally occupied by local craft. 30 The bay is exposed only to south-easterly winds, but anchorage is not recommended in the outer part.

The village of Sali, at the head of the bay, contained 2,750 inhabitants, in 1931. There is regular steamer communication with Sušak, Šibenik and Kotor. 35

Uvala Šašćica lies about 2 cables north-westward of Uvala Sali. There is a boat harbour at the head of this cove.

Uvala Triluke (Zaglava) lies about three-quarters of a mile north-westward of Uvala Šašćica. Hrid Pokljib (Poklib), 13 feet (4^m0) high, lies near the outer end of a shallow spit extending about 3 cables north-eastward from the south-eastern entrance point of this bay. Within 40 Uvala Triluke there are three coves, in the north-western of which there is a boat harbour. The bay is exposed to the Bora and southerly winds which cause a swell.

The village of Zaglava, which had a population of 320, in 1931, lies 45 about 4 cables north-westward of the north-western entrance point of Uvala Triluke; a monastery stands close northward of the village. There is steamer communication with Sali and Šibenik.

The islets and dangers lying off the north-western end of Otok Laudara are described on pages 333, 334. Laudarski kanal is entered 50 from north-westward, between Otočić Tukošćak and the north-western entrance point of Uvala Triluke.

On the south-western side of the approach to this end of Laudarski

Charts 1440, 2158a.

Chart 2774.

kanal, there is a bight in the coast of Dugi otok between a point, about 4 cables north-westward of Hrid Pokljib (*Lat. 43° 57' N., Long. 15° 09' E.*), and Rt Žman, about $1\frac{1}{2}$ miles farther north-westward; Otočić Krknata, 59 feet (18^m0) high, and covered with olive trees and vines, lies with its southern extremity about 2 cables northward of the south-eastern entrance point of the bight. There is a jetty at the northern end, and a boat harbour on the south-western side of this islet. Otočić Krava (Vacca), 79 feet (24^m1) high, and of a light colour, lies a short distance north-eastward of the southern end of Otočić Krknata, connected to the eastern side of that islet by a bank, over which there is a depth of $3\frac{1}{2}$ fathoms (5^m9).

Uvala Žmanšćica, where there is a boat harbour, lies at the north-western end of the bight just mentioned, about half a mile south-westward of Rt Žman. Small craft can secure to the head of the outer jetty. The village of Žman, which had a population of 700, in 1931, is situated a short distance southward of the harbour. There is regular steamer communication with Sali and Šibenik.

Lights.—The light on the north-western extremity of Otok Laudara is described on page 334.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 18 feet (5^m5) in height, on the molehead at Uvala Sali.

A light is exhibited, at an elevation of 14 feet (4^m3), from an iron column, 12 feet (3^m7) in height, on the north-western entrance point of Uvala Triluke.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 18 feet (5^m5) in height, on the northern entrance point of Uvala Žmanšćica.

Anchorage.—Uvala Šašćica affords shelter to small craft, with their sterns secured to the shore. Vessels bound for Sali shelter in this cove in strong southerly and south-easterly winds.

Vessels of moderate size can anchor between Otočić Krknata and Dugi otok, in depths of 9 or 10 fathoms (16^m5 or 18^m3), sand.

*Charts 2774, 2711.***35 CHANNELS BETWEEN OTOK IŽ AND DUGI OTOK.**—

There are two channels between Otok Iž and Dugi otok, entered, from south-eastward between Rt Parda, page 334, and Rt Žman, and from north-westward, between Rt Osiljenac, page 336, and Rt Kamik. Otok Rava lies nearly midway between these two channels with Iški kanal on its north-eastern side and Ravski kanal, on its south-western side.

Chart 2774.

Telegraph cable.—A submarine cable, indicated on the chart, is laid between Dugi otok and Otok Iž near the south-eastern end of Iški kanal.

45 Iški kanal.—Islets and dangers.—Rt Luka lies on the south-western side of Iški kanal, about $1\frac{1}{2}$ miles north-westward of Rt Žman. A shoal, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, lies close off the coast of Dugi otok, about 2 cables south-eastward of Rt Luka. Otočić Luški, 213 feet (64^m9) high, lies close north-westward of Rt Luka, to which it is connected by a bank, over which there is a depth of $1\frac{1}{2}$ fathoms (2^m7); a rock, covered at high water, lies about $1\frac{1}{2}$ cables off the south-eastern side of this islet and 2 cables north-north-westward of Rt Luka.

Charts 1440, 2158a.

Chart 2774.

Ravski kanal is entered from eastward between the north-western end of Otočić Luški and Rt Kuncarava, the south-eastern extremity of Otok Rava, about half a mile northward; Otočić Maslinovac (*Lat.* 44° 00' N., *Long.* 15° 05' E.), 79 feet (24^m1) high, covered with bushes, and of a light colour, lies in the middle of the approach to Ravski kanal, about 3½ cables south-eastward of Rt Kuncarava.

Hrid Ravica, 16 feet (4^m9) high, lies close off the south-eastern end of Otok Rava, connected by a reef.

On the north-eastern side of the channel, the south-western side of Otok Iž is mostly covered with bushes. Otočić Fulija (Fulija), 141 feet (43^m0) high, lies about 2½ miles north-westward of Rt Parda and 3 cables off the coast of Otok Iž; a shoal, with a depth of 4½ fathoms (7^m8) over it, lies about 4 cables south-eastward, and a similar shoal lies about 2 cables north-westward, of this islet. A shoal, with a depth of 4½ fathoms (8^m7) over it, lies midway between the last mentioned shoal and the coast of Otok Iž, north-eastward. Otočić Kudica, 85 feet (25^m9) high, lies about a mile north-westward of Otočić Fulija and 2 cables off the coast of Otok Iž; a reef extends about 1½ cables off the south-western side of this islet; a shoal, with a depth of 5½ fathoms (10^m1) over it, lies 3 cables west-south-westward, and a shoal, with a depth of 6 fathoms (11^m0) over it, lies about the same distance north-westward, of the islet.

On the south-western side of the channel, Otok Rava is 322 feet (98^m1) high near its south-eastern end, and mostly covered with olives and vines, and partly with bushes. The village of Rava, with a conspicuous church, is situated near the middle of the island. The north-eastern side of Otok Rava is indented. In the cove westward of Rt Mali rat, situated about 1½ miles north-westward of Rt Kuncarava, there is a boat harbour. A 6½-fathom (11^m9) patch lies midway between Rt Mali rat and Rt Obrajac, the north-eastern extremity of the island, about 8 cables north-westward. Uvala Tanko lies at the northern end of Otok Rava midway between Rt Obrajac and Rt Zaglav, the north-western extremity of the island.

Rt Poljištinac is situated on the coast of Otok Iž, about a mile north-north-eastward of Rt Obrajac; this is the narrowest part of Iški kanal, and farther north-westward the channel widens considerably. Ravski kanal is entered from north-westward between Rt Zaglav and a point on the coast of Dugi otok, about a mile west-north-westward.

A shoal, with a depth of 4½ fathoms (7^m8) over it, lies about half a mile north-north-westward of Rt Zaglav. Hrid Pokljiba (Pohlib), 23 feet (7^m0) high, lies about a mile north-westward of Rt Zaglav and 2½ cables off the coast of Dugi otok.

On the north-eastern side of the channel, a shoal with a depth of 6 feet (1^m8) over it, lies about half a mile north-westward of Rt Poljištinac and 1½ cables off a peninsula extending a short distance north-westward from the coast of Otok Iž. Uvala Soline lies on the eastern side of this peninsula. For anchorage, *see* page 348.

Between Uvala Soline and Rt Osiljenac, about 1½ miles northward, several islets lie off the coast of Otok Iž; Otočić Krajnji, 89 feet (27^m1) high, lies a short distance north-westward of Uvala Soline, connected to the coast eastward by a narrow shallow bank, with an above-water rock on it. Otočić Srednji (Srednjak Veliki), 115 feet (35^m0) high, with Otočić Mali, 20 feet (6^m1) high, close off its northern end, lies

Chart 2774.

about $1\frac{1}{2}$ cables north-westward of Otočić Krajnji, and Otočić Belo, 138 feet (42^m1) high, lies about 3 cables north-westward of Otočić Mali and half a mile off the north-western end of Otok Iž.

- 5 Luka Osiljenac lies between these islets and Otok Iž. A shoal, with a depth of 3 fathoms (5^m5) over it, lies midway between Otočić Belo and Otok Iž. For anchorage, *see* below.

The dangers lying north-westward and west-north-westward of Rt Osiljenac are described on page 336.

10 *Chart 2711.*

On the south-western side of the channel, Rt Pelegrin (*Lat.* $44^{\circ} 04' N.$, *Long.* $15^{\circ} 01' E.$), the northern extremity of an islet, connected to the coast of Dugi otok by a shallow reef, lies about a mile north-north-westward of Hrid Pokljiba; there is a chapel on this islet, with

- 15 a stone cross in front of it. Uvala Savar, exposed to winds from the northern semicircle, which cause a considerable sea, lies on the western side of Rt Pelegrin. The village of Savar, which contained 382 inhabitants, in 1931, is situated on the south-western side of this cove and there is a boat harbour on the eastern side. For anchorage, *see* below.

Uvala Brbinj (Brbinj Jaz) is entered between a point, about 6 cables north-westward of Rt Pelegrin, and Rt Koromašnjak, page 337, about 3 cables farther north-westward. There is a wharf in this bay. Southerly winds cause a sea; otherwise the bay is well protected.

- 25 The bottom is mud and good holding ground. For anchorage, *see* below.

The village of Brbinj, which contained 450 inhabitants, in 1931, lies at the north-western end of the bay. There is regular steamer communication with Sali and Šibenik.

- 30 The light on Rt Koromašnjak is described on page 337.

The coast for some distance northward of Rt Koromašnjak is bordered by a shallow rocky bank.

Chart 2774.

- Anchorage in Iški kanal.**—Small vessels can anchor in Uvala Soline, protected from all winds; the best anchorage is close to the shore, in a depth of about 2 fathoms (3^m7).

Medium sized vessels, with local knowledge, can anchor in the centre of the southern part of Luka Osiljenac, sand; during a Bora, a cable should be laid out ashore.

40 *Chart 2711.*

Uvala Savar can be used as an anchorage by small vessels in southerly winds.

- In Uvala Brbinj, small vessels with local knowledge, can find shelter in a creek in its north-western corner. In strong southerly winds, it is advisable to anchor in a small cove in the south-western part of the bay.

Chart 2774.

- Ravski kanal.**—**Islets and dangers.**—Uvala Luka is situated at the south-eastern end of Ravski kanal, between Rt Luka and Otočić Luški, on its north-eastern side, and Dugi otok, south-westward. A bank, with a depth of 2 fathoms (3^m7) over it, extends about a cable from the south-eastern side of this bay; the head is shallow and rocky. The village of Luka, which had a population of 358, in 1931, lies at the head of the bay. Here there is a mole to which vessels drawing

Chart 2774.

up to 10 feet (3^m0) can secure, and some boat jetties. A conspicuous windmill stands on the slope of the hill above the village. For anchorage, see below.

On the north-eastern side of the channel, Rt Garmina (*Lat.* 44° 01' N., *Long.* 15° 03' E.), the south-western extremity of a promontory extending westward from Otok Rava, lies about 1½ miles north-westward of Rt Kuncarava; a bank, with a depth of 3½ fathoms (6^m9) over it, extends about a cable off a point situated about half a mile west-north-westward of Rt Kuncarava, and a bank, with a depth of 4½ fathoms (7^m8) over it, extends about a cable off a point, about 2½ cables south-eastward of Rt Garmina. Uvala Marinica, in which there is an embankment to which small craft can secure, and a boat harbour, lies close south-eastward of Rt Garmina. This bay is only exposed to south-westerly winds; the bottom consists of mud and is good holding ground.

A rocky shoal, with a depth of 5½ fathoms (9^m6) over it, lies 1½ cables south-westward of Rt Garmina, and a shoal, with a depth of 4½ fathoms (8^m7) over it, extends about a cable off the coast of Dugi otok farther south-westward; the fairway of the channel is about 2 cables wide between these shoals.

Between Rt Garmina and Rt Zaglav, page 347, the coast is indented. Uvala Lokvino, exposed only to south-westerly winds, lies about 3 cables south-eastward of Rt Zaglav. There are several jetties at the head of this bay to which small craft can secure. The village of Rava Mali lies on the eastern side of the bay.

Otočić Mrtovnjak, 151 feet (46^m0) high and bare, lies nearly in the middle of the north-western end of Ravski kanal, about 4 cables west-south-westward of Rt Zaglav; Hrid Galica (Galjac), 3 feet (0^m9) high, lies about 1½ cables southward of this islet, connected by a shoal, with a depth of 3½ fathoms (6^m9) over it.

A shoal, with a depth of 4½ fathoms (7^m8) over it, lies about 2 cables north-north-westward of Otočić Mrtovnjak.

Light.—A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column on Rt Garmina.

Anchorage.—In Uvala Luka there is good anchorage, sheltered from all winds except the Bora. Large vessels are best moored southward of the summit of Otočić Luški, in a depth of about 13 fathoms (23^m8), sand, good holding ground; farther north-westward the sand is mixed with coral and the holding ground is less reliable. Small vessels can anchor nearer the village, but the bottom is rocky in places.

Charts 1561, plan of Maknare channel, 2774, 2711.

CHANNELS AT THE NORTH-WESTERN END OF SREDNJI KANAL.—At the north-western end of Srednji kanal, there are five channels leading to the waters farther north-westward. Veli Zdrelec, the easternmost of these channels, page 326, and Rivanjski kanal lead into the north-western end of Zadarski kanal; Sestrunjski kanal, the middle channel, leads into the eastern approach to Prolaz Maknare; Tunski kanal and Zverinački kanal, the westernmost, lead into the southern side of Prolaz Maknare.

Rivanjski kanal.—The south-eastern entrance to this channel is described on page 337. Otočić Paranci Veliki, 36 feet (11^m0) high,

Charts 1440, 2158a.

Charts 1561, plan of Maknare channel, 2774, 2711.

with Otočić Paranci Mala, 46 feet (14^m0) high, 2½ cables northward, lies about 3 cables off the south-eastern end of Otok Sestrunj; the latter islet is connected to Otok Sestrunj by a bank, with a depth of 5 3¼ fathoms (5^m9) over it, about a cable wide.

Uvala Muline, in which there is a boat harbour, lies on the south-western side of the channel, about 1½ miles north-westward of Otočić Paranci Mala. There is another boat harbour on the coast of Otok Rivanj opposite, situated about a mile south-eastward of Rt Zanavin, 10 the north-western extremity of that island.

The south-western side of Otok Rivanj is bordered by a narrow bank, with depths of 3 fathoms (5^m5) over it.

Uvala Hrvatin, in which there are some boat jetties, is situated on the coast of Otok Sestrunj, about a mile west-south-westward of Rt 15 Zanavin.

The islets and dangers lying on the north-eastern side of the channel, north-westward of Otok Rivanj, are described on page 327.

Uvala Travnik lies on the north-eastern side of Otok Sestrunj, about half a mile south-eastward of Rt Križa (*Lat. 44° 12' N., Long. 20 14° 57' E.*).

Tidal streams.—The direction of the stream in Rivanjski kanal changes with the tides; at springs, the stream attains a rate of 4 knots.

Anchorage.—There is anchorage, in a depth of about 19 fathoms 25 (34^m7), sand and shells, westward of the summit of Otok Rivanj.

The anchorage between Otočići Tri Sestrice and Otok Sestrunj is described on page 329.

Uvala Hrvatin affords good anchorage in southerly winds over a bottom of sand and mud. Northerly and north-easterly winds cause 30 a considerable sea in this bay.

Uvala Travnik affords shelter in southerly winds.

Chart 2711.

Sestrunjski kanal and approach.—Sestrunjski kanal is approached from south-eastward along the south-western side of Otok 35 Sestrunj. Uvala Kablin lies eastward of Rt Nozdra (Kablin), situated about a mile north-westward of Rt Mavrovica, the southern extremity of Otok Sestrunj (*Lat. 44° 08' N., Long. 15° 02' E.*). There are some jetties at the head of this bay, to one of which, vessels drawing up to 10 feet (3^m0) can secure. For anchorage, see page 351.

40 Uvala Triluke, in which there is a boat harbour, and Uvala Dumbočica lie 1½ and 1¾ miles, respectively, north-westward of Rt Nozdra. For anchorage, see page 351.

On the south-western side of the approach, Južni (Južnja) rt, the south-eastern extremity of Otok Zverinac, lies about 1½ miles south- 45 westward of the western entrance point of Uvala Dumbočica. Tunski kanal is entered between Južni rt and Rt Veli Bok, the south-eastern extremity of Otok Tun Veli; Sestrunjski kanal is entered between the latter point and Rt Kuzmino, on the south-western side of Otok Sestrunj, about 1½ miles east-south-eastward.

50 A shoal, with a depth of 4¼ fathoms (7^m8) over it, lies about 2 cables north-westward of Rt Kuzmino and a cable off a projection which separates two coves.

Otok Tun Veli is a hilly ridge, 413 feet (125^m9) high, covered with brushwood and steep-to.

Charts 1440, 2158a.

Chart 1561, plan of Maknare channel.

At the north-eastern end of the channel, Uvala Bela Njiva lies on the south-western side of Rt Križa. A spit with a depth of $2\frac{1}{4}$ fathoms (4^m1) over it, extends 2 cables off the south-western entrance point of this cove, about 4 cables south-south-westward of Rt Križa (*Lat.* 5 $44^\circ 12' N.$, *Long.* $14^\circ 57' E.$). For anchorage, see below.

Otočić Vrtlac (Vrtljak), 16 feet (4^m9) high, lies in the northern approach to Sestrunjski kanal, about 6 cables westward of Rt Križa; a bank, with depths of less than 5 fathoms (9^m1) over it, extends about 2 cables north-westward of this islet, and a shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, lies a short distance off the end of the bank. *Chart 2711.*

Anchorage.—Uvala Kablin affords shelter to small vessels in a Bora or in northerly winds. Southerly winds cause a considerable sea.

Uvala Dumbočica affords good anchorage in a Bora to vessels with local knowledge.

Chart 1561, plan of Maknare channel.

Uvala Bela Njiva affords shelter during southerly winds.

Charts 1561, plan of Maknare channel, 2711.

Tunski kanal.—**Light.**—Tunski kanal lies between Otok Tun Veli, on its north-eastern side, and Otok Zverinac (Zvirinac), on its south-western side. The channel, about 6 cables wide in its narrowest part, is deep and clear of danger.

Otok Zverinac is hilly, mostly covered with bushes, with some cultivation on its south-western side; its summit, 384 feet (117^m0) high, is situated about a mile north-westward of Južni rt. The village of Zverinac, in which there is a conspicuous chapel, lies in the middle of the island, and contained 170 inhabitants, in 1931.

Between Zmorašnji rt, the north-western extremity of Otok 30 Zverinac, and the north-western extremity of Otok Tun Veli, about a mile north-eastward, Tunski kanal leads into Prolaz Maknare.

A light is exhibited, at an elevation of 88 feet (26^m8), from a white conical iron tower, 23 feet (7^m0) in height, on the north-western end of Otok Tun Veli.

Zverinački kanal.—**Islets and dangers.**—Zverinački kanal lies between Otok Zverinac and the north-western end of Dugi otok; it is entered from south-eastward between Otočić Planatak Veliki, page 337, and Južni rt. Neither the Bora nor southerly winds are felt very much in this channel.

Otočić Šilo, 59 feet (18^m0) high, lies a short distance westward of Južni rt, and is joined to it by a bank, with a depth of $2\frac{1}{4}$ fathoms (5^m0) over it. Otočić Sparešnjak, 52 feet (15^m8) high, lies about half a mile south-south-eastward of Južni rt; depths of less than 5 fathoms (9^m1) extend about $1\frac{1}{2}$ cables south-eastward of this islet, and a bank with depths of $4\frac{1}{4}$ fathoms (7^m8) over it, extends about 3 cables north-westward of the islet.

On the south-western side of the channel, Otočić Magarčić, 92 feet (28^m0) high, lies about a mile south-westward of Otočić Sparešnjak. Uvala Dumboka, in which there are some jetties for boats, is situated on the coast of Dugi otok, about half a mile south-south-eastward of Otočić Magarčić; a shoal, with a depth of $4\frac{1}{4}$ fathoms (7^m8) over it, lies about half a mile north-westward of this islet and 3 cables offshore.

Sušolina (Sušanji), a peak, 735 feet (224^m0) high, stands about half

Charts 2711, 1440, 2158a.

N*

Charts 1561, plan of Maknare channel, 2711.

a mile inland from Uvala Dumboka, whence the hills decrease in height towards the northern end of Dugi otok. A chapel standing about 8 cables south-eastward, and another chapel, about 4 cables north-
5 north-westward of Šušolina, are conspicuous.

Rt Sveta Nedelja, with a conspicuous chapel on it, lies about a mile north-westward of Otočić Magarčić. The village of Božava, which contained 300 inhabitants, in 1931, lies at the head of a cove, about 2 cables westward of Rt Sveta Nedelja. Here there are quays for
10 vessels, drawing up to 6 feet (1^m8), and some boat jetties. There is regular steamer communication with other ports in Yugoslavia.

The south-western side of Otok Zverinac is indented. Uvala Kablin lies about a mile north-westward of Južni rt. There is a boat harbour at the head of the bight, under the village of Zverinac, near the centre
15 of the island. Rt Škrvada (Skrivada) lies about a mile south-eastward of Zmorašnji rt, the north-western extremity of the island.

On the south-western side of the channel, Rt Kruna lies about a mile north-westward of Rt Sveta Nedelja and Rt Zaglavić is situated about a mile farther north-westward. Uvala Dobra is entered between
20 Rt Zaglavić and a point about half a mile west-north-westward. A sunken rock, which breaks, lies on a shallow bank extending about a cable from the southern side of this bay, 2 cables within its eastern entrance point; the western part of the bay is shallow.

Uvala Lojišće is situated about a mile north-westward of Uvala
25 Dobra, and Rt Borji, the north-western extremity of Dugi otok, lies about 4 cables farther north-westward.

Otočić Bršćak, 141 feet (43^m0) high at its northern end, lies close off Rt Borji, to which it is connected by a shallow reef. Zverinački kanal leads into Prolaz Maknare between Otočić Bršćak and Zmorašnji
30 rt, about 1½ miles south-eastward.

A number of dangers lie in the north-western part of Zverinački kanal; a rocky shoal, with a depth of 4½ fathoms (8^m7) over it, lies about 2½ cables southward of Rt Škrvada and 4 cables off Dugi otok. A rocky shoal, with a depth of 4½ fathoms (8^m2) over it, lies about
35 2 cables east-north-eastward of Rt Zaglavić and 3 cables off Otok Zverinac. Between Uvala Dobra and Uvala Lojišće there are two reefs, about 1½ cables apart; the western reef has a depth of 5 feet (1^m5) over it, is steep-to, and lies about 2 cables off the coast of Dugi otok; the eastern reef extends from 2 to 4½ cables off the coast of Dugi
40 otok, and has a depth of 6 feet (1^m8) over its south-western end, which breaks, and 2½ fathoms (4^m6) over its north-eastern end. The passage between this reef and Otok Zverinac is deep and 4 cables wide. Both these shoals are difficult to distinguish.

A shoal, with a depth of 5½ fathoms (10^m5) over it, lies 3 cables north-
45 north-eastward of Rt Borji and 2 cables off Otočić Bršćak.

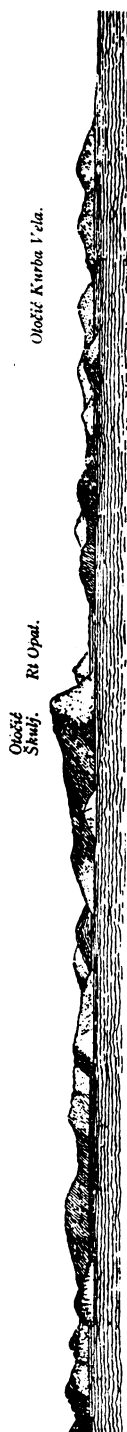
Light.—Anchorages.—A light is exhibited, at an elevation of 27 feet (8^m2), from a pyramidal iron framework structure, 15 feet (4^m6) in height, on Rt Sveta Nedelja (*Lat.* 44° 08' N., *Long.* 14° 55' E.).

Small vessels can find shelter, from all except southerly winds, at
50 the head of Uvala Kablin, near the shore.

There is anchorage off the head of the bight below the village of Zverinac, near the coast, in depths of about 11 fathoms (20^m1), sheltered from north-easterly winds.

Small vessels, with local knowledge, can anchor in the western part

Charts 1440, 2158a.



Islets off south-eastern end of Otok Kornat.

(Original dated 1928)



View in 2 parts of Dugi otok from south-westward.

(Original dated 1910.)

Charts 1561, plan of Maknare channel, 2711.

of Uvala Dobra, over a bottom of sand and mud, good holding ground, protected from all winds.

Telegraph cable.—A submarine cable, indicated on the charts, is laid in the north-western end of Zverinački kanal from Uvala Zagračina, situated westward of Rt Kruna, connecting Dugi otok with 5
Otok Molat.

Directions.—See page 338.

Chart 2774.

KORNATSKI KANAL.—**General description.**—Kornatski kanal 10
is approached from south-eastward between the islets on the south-western side of the approach to Žutski kanal, described on page 339, and a number of other islets lying off the south-eastern end of Otok Kornat.

The channel is entered between Opat hill, page 339, and Otočić 15
Škulj, about half a mile south-westward, the highest of a continuous chain of islets and dangers, with deep water between them, which form the south-western side of the channel, and lie off the coast of Otok Kornat; the latter island forms the north-eastern side of the channel. Towards the north-western end there are numerous anchorages for 20
small vessels in the channel, but navigation is difficult without local knowledge, especially as the tidal streams set strongly through the narrow passages. Most of the dangers, however, are above water. See view facing this page.

Islets and dangers in approach.—Otočić Kurba Vela, 384 feet 25
(117^m0) high at its eastern end, the largest of the islets in the approach, lies with Rt Mede (*Lat.* 43° 41' N., *Long.* 15° 31' E.), its eastern extremity, about 1½ miles westward of Otočić Samograd, page 305, Otočić Skrižanj (Zgrižanj) Veliki, 66 feet (20^m1) high, with Otočić 30
Skrižanj Mala, 33 feet (10^m1) high, close north-westward, lies midway between the eastern end of Otočić Kurba Vela and Otočić Mrtovnjak, page 305. See view on chart 2774.

The two Otočići Buhe, about 3 cables apart, the eastern of which is 59 feet (18^m0) high, lie about half a mile southward of the eastern end of Otočić Kurba Vela. Hridi Pusi, with depths of less than 6 feet 35
(1^m8) over them, lie a short distance north-eastward of the western of these islets; Pličina Buha, with a depth of 4 fathoms (7^m3) over it, lies 7 cables south-eastward of the eastern islet; and Pličina Lumbarda, with a depth of 1½ fathoms (2^m3) over it, lies about half a mile farther south-south-westward and 9 cables west-south-westward of Greben 40
Pjat, page 306.

Otočić Opuh Mala, 30 feet (9^m1) high, with Otočić Opuh Veliki, 49 feet (14^m9) high, 1½ cables north-westward, lies about half a mile west-south-westward of the western of Otočići Buhe. Otočić Lusmarinjak, 148 feet (45^m1) high, and Otočić Oključ, 223 feet (68^m0) high, 45
lie about half a mile and 1½ miles, respectively, north-westward of Otočić Opuh Veliki, the latter at a distance of 3 cables off Otočić Kurba Vela. A spit, with a depth of 3 fathoms (5^m5) over it, extends about 1½ cables off the southern extremity of Otočić Oključ.

Otočić Škulj, 476 feet (145^m1) high, lies with its south-eastern end 50
about 3 cables north-westward of Otočić Kurba Vela; a number of islets and rocks lie southward of Otočić Škulj, the positions of which can best be seen on the chart. Otočić Grmenjak (Garmenjak) Veliki,

Charts 1440, 2158a.

Chart 2774.

184 feet (56^m1) high, the southernmost of these islets, lies about half a mile from the southern extremity of Otočić Škulj. A shoal, with a depth of 5½ fathoms (10^m1) over it, lies on the end of a spit extending 5 2 cables south-south-eastward from Otočić Grmenjak Veliki, and a sunken rock lies about 1½ cables westward of the same islet.

Otočić Purara, 98 feet (29^m9) high, and easily distinguished owing to its isolation, lies about a mile west-south-westward of Otočić Grmenjak Veliki. Hrid Klint, 13 feet (4^m0) high, lies about 2 cables 10 off the south-eastern end of Otočić Purara, and Hrid Volić (Purara), 3 feet (0^m9) high, lies about 3½ cables north-westward of the same islet.

Channel.—Islets and dangers.—A shoal, with a depth of 1½ fathoms (2^m7) over it, lies 1½ cables off the north-western end of Otočić Škulj. Uvala Opat and the shoal lying off its western entrance 15 point, on the north-eastern side of the channel, are described on page 339.

Otočić Ravni Žakan, 125 feet (38^m1) high, lies on the south-western side of the channel, 2 cables westward of Otočić Škulj, and Otočić Lunga (Duga), 266 feet (81^m1) high, lies close westward of the former 20 islet, connected to it by a bank, with a depth of 2½ fathoms (5^m0) over it; a shoal, with a depth of 2½ fathoms (4^m6) over it, lies about 1½ cables north-westward of the northern extremity of Otočić Lunga. There is a boat harbour in the cove on the north-western side of Otočić Ravni Žakan.

25 Otočić Kameni Žakan, 108 feet (32^m9) high, lies 1½ cables southward of the eastern end of Otočić Ravni Žakan, joined by a bank, with a depth of 4½ fathoms (7^m8) over it. Otočić Jančar, 66 feet (20^m1) high, and Otočić Žakanac lie on a bank which extends about 4 cables off the western side of Otočić Kameni Žakan. Luka Žakan is situated 30 in the area between Otočić Ravni Žakan and the three islets southward of it. For anchorage, see page 357.

A shoal, with a depth of 3½ fathoms (5^m9) over it, lies about 2½ cables south-eastward of Otočić Kameni Žakan. A rock, with a depth of less than 6 feet (1^m8) over it, with a similar rock, about 1½ cables north- 35 north-westward of it, lies in the southern approach to Luka Žakan, about 4 cables west-south-westward of the southern extremity of Otočić Kameni Žakan.

Otočić Gominjak, 207 feet (63^m1) high, with a 5-fathom (9^m1) patch close off its south-eastern end, lies about 2 cables south-westward of 40 Otočić Lunga. Otočić Vodenjak, 144 feet (43^m9) high, with a 1½-fathom (2^m7) patch close off its south-eastern side, lies about 2 cables north-westward of Otočić Gominjak.

The larger of the two Otočići Prišnjak (Crnikovci), 115 feet (35^m0) high, with the smaller islet about a cable south-eastward of it, lies 45 about 3 cables northward of Otočić Vodenjak. A shoal with a depth of 3½ fathoms (6^m4) over it, lies, in the channel, about 3 cables north-eastward of the larger of these two islets.

On the north-eastern side of the channel, Otočić Ravna, 98 feet (29^m9) high, with Otočić Bisaga, 43 feet (13^m1) high, close westward of 50 its southern end, lies about a mile north-eastward of the larger of Otočići Prišnjak and 1½ cables off the coast of Otok Kornat. A rocky shoal, with a depth of 2½ fathoms (4^m6) over it, lies about 2 cables west-north-westward of Otočić Bisaga (*Lat.* 43° 45' N., *Long.* 15° 25' E.).

Charts 1440, 2158a.

Chart 2774.

Otočić Krpeljina (Čaparinjak), 62 feet (18^m9) high, lies about a mile north-westward of Otočić Ravna and 2 cables offshore. A 3½-fathom (6^m9) patch lies 6 cables north-westward of Otočić Krpeljina and 3 cables offshore, and a 2-fathom (3^m7) patch lies about 6 cables farther 5 north-westward and 1½ cables offshore.

On the south-western side of the channel, Otočić Kasela, 174 feet (53^m0) high at its southern end, lies 2½ cables north-westward of the larger of Otočići Prišnjak; Hrid Kaselica lies midway between the southern ends of these two islets. Otočić Gustac, 256 feet (78^m0) 10 high, with Otočić Klobučar, 269 feet (82^m0) high, close off its southern end, lies about 2 cables north-westward of Otočić Kasela. Viewed from westward, Otočić Kasela and Otočić Klobučar are readily distinguished as they appear shaped like pyramids and come straight down to the water; there are some conspicuous patches of red rock 15 on the latter islet.

Otočić Lavsa, 367 feet (111^m9) high on its south-eastern side, lies about a cable north-westward of Otočić Gustac. A shoal, with a depth of 2½ fathoms (5^m0) over it, lies near the middle of the north-eastern end of the passage between these two islets. A shoal, with 20 a depth of 2 fathoms (3^m7) over it, lies about a quarter of a mile north-westward of the southern extremity of Otočić Lavsa and close offshore.

Uvala Lavsa, on the eastern side of the head of which there are some boat jetties, is situated on the northern side of that islet. For anchorage, see page 357. 25

Otočić Jadra, 417 feet (127^m1) high at its eastern end, lies north-westward of Otočić Lavsa, with a least depth of 3½ fathoms (6^m9) in the fairway of the narrow passage between. Otočić Panitula Veliki, 118 feet (36^m0) high, lies close off the south-western side of Otočić 30 Jadra, near its eastern end; Otočić Panitula Mala, 92 feet (28^m0) high, lies a short distance farther eastward, with Hridi Škanji between.

Luka Piškera is situated between Otočić Panitula Mala and the south-eastern end of Otočić Jadra, about 1½ cables northward. For anchorage, see page 357.

Otočić Veseljuh, 13 feet (4^m0) high, lies on a shallow bank which 35 extends about 2½ cables from the northern part of the eastern end of Otočić Jadra. Hrid Kamičić, 3 feet (0^m9) high, with a sunken rock close eastward of it, lies about 6 cables west-north-westward of Otočić Veseljuh and 2 cables off the northern side of Otočić Jadra.

Otočić Blitvica, 26 feet (7^m9) high, lies in mid-channel, about 40 3 cables north-north-eastward of Hrid Kamičić. Otočić Gustac, 141 feet (43^m0) high, with an above-water rock close off its eastern side, lies about 1½ cables north-westward of Otočić Blitvica. A shoal, with a depth of 4½ fathoms (7^m8) over it, lies about a cable off the south-western side of Otočić Gustac near its south-eastern end. 45

A spit, with a reef at its outer end, extends about 3 cables south-eastward from a point on the south-western side of Otok Kornat, situated about half a mile north-north-eastward of Otočić Blitvica (Lat. 43° 46' N., Long. 15° 21' E.).

Otočić Koritnjak, 161 feet (49^m1) high, lies about 2½ cables north- 50 westward of Otočić Gustac and a short distance off the entrance to Uvala Guljak (Gunduc), situated on the coast of Otok Kornat; there is a boat harbour at the head of this bay. For anchorage, see page 357.

On the south-western side of the channel, Otočić Rašip Veliki, 203

Chart 2774.

feet (61^m9) high, with Otočić Rašipić, 39 feet (11^m9) high, 1½ cables northward of its western end, lies about 2 cables north-westward of Otočić Jadra. A shoal, with a depth of 2½ fathoms (5^m0) over it, lies
 5 near the middle of the northern end of the passage between these two islets. This passage is one of the best into Kornatski kanal from south-westward and can be distinguished by three clefts on Otočić Rašip Veliki, the middle one of which is conspicuous both from south-eastward and north-westward.

10 Otočić Rašip Mala, 184 feet (56^m1) high, lies about 3½ cables north-westward of Otočić Rašip Veliki; this is one of the widest openings in the chain of islets lying off the south-western side of Otok Kornat. A ridge, on the outer end of which there is a rock, with a depth of 2 feet (0^m6) over it, extends about 2 cables south-eastward from the
 15 north-eastern end of Otočić Rašip Mala.

Hridi Kamenčići (Kamčić), the northern of which is 16 feet (4^m9) high, and the southern, 6 feet (1^m8) high, lie on a bank, about 2 cables long, situated with its south-eastern end about 1½ cables westward of the north-western extremity of Otočić Rašip Mala.

20 Otočić Arapovac lies nearly in mid-channel between Otočić Rašip Mala and a point, on which there is a stone cross, on the coast of Otok Kornat, about 8 cables north-eastward; a shoal, with a depth of 2½ fathoms (5^m0) over it, lies about 2 cables west-south-westward of
 25 Otočić Arapovac. Otočić Maslinjak, 128 feet (39^m0) high, lies about 2 cables north-westward of Otočić Arapovac and 3 cables offshore.

On the south-western side of the channel, Otočić Mana, 253 feet (77^m1) high at its eastern end, lies about 6 cables north-westward of Otočić Rašip Mala. The south-western of the two Otočići Babuljaši, 36 feet (11^m0) high, lies 2 cables eastward of Otočić Mana, and the
 30 north-eastern of the two, 23 feet (7^m0) high, lies about 2 cables farther east-north-eastward. Otočić Bisagica lies about 2 cables north-westward of Otočić Maslinjak and Otočić Bisaga, 72 feet (21^m9) high, about a quarter of a mile farther north-westward; Otočić Golić, 20 feet (6^m1) high, lies close off the north-western end of the latter islet, con-
 35 nected to it by a shallow bank. The village of Vrulje, about 8 cables north-eastward of Otočić Bisagica, lies at the head of the eastern of two coves in a bay in the coast of Otok Kornat. There is a boat harbour in each of these coves. For anchorage, *see* page 357.

Uvala Modri Bok (Bisage) lies about three-quarters of a mile north-
 40 westward of Vrulje (*Lat.* 43° 49' N., *Long.* 15° 18' E.). For anchorage, *see* page 357.

Uvala Kravljačica lies north-westward of Uvala Modri Bok, between a point, about 3½ cables north-eastward of Otočić Golić and a point, about 6 cables farther north-westward. Otočić Strižnjak, 39 feet
 45 (11^m9) high, lies in the south-eastern part of this bay, joined to the south-eastern entrance point by a bank, with a depth of 2 fathoms (3^m7) over it. There are some boat jetties in a cove in the north-western part of the bay. For anchorage, *see* page 357.

Otočić Pleščina, 89 feet (27^m1) high, lies on the south-western side
 50 of the channel, a short distance northward of Otočić Mana, its south-eastern end being joined to that islet by a shallow bank. Two shoals, one with a depth of 3½ fathoms (5^m9) over it, and the other with a depth of 3½ fathoms (6^m9) over it, lie about one and 2 cables, respectively, off the north-western end of Otočić Pleščina.

Charts 1440, 2158a.

Chart 2774.

Otočić Borovnik, 184 feet (56^m1) high, with Otočić Balun, 95 feet (29^m0) high, a short distance off its southern side, lies about 4 cables north-westward of Otočić Mana. Otočić Levrnaka, 387 feet (118^m0) high, lies about a cable northward of Otočić Borovnik. Uvala Lojena is situated on the south-western side of Otočić Levrnaka; a shoal, with a depth of 4 fathoms (7^m3) over it, lies about a cable southward of the western entrance point of this bay. For anchorage, *see* page 358. 5

Otočić Mrtvac, 118 feet (36^m0) high, lies a short distance off the south-western side of Otočić Levrnaka, near its north-western end, and Otočić Obručan Veliki, 217 feet (66^m1) high, with Otočić Obručan Mala (Trbuh), close west-north-westward, lies close off the north-western end of the same islet. 10

Uvala Levrnaka, on the south-western side of which there is a boat harbour, lies on the northern side of the eastern end of that islet. Otočić Sušica, 69 feet (21^m0) high, lies close north-westward of the eastern entrance point of this bay. For anchorage, *see* page 358. 15

Between Otočić Levrnaka and Otok Kornat, the channel is only 2 cables wide. The ruins of Tarac (Torette), situated on Otok Kornat about 4 cables eastward of the southern extremity of Otočić Sušica, are conspicuous. 20

Uvala Bele Lučice, where there is a boat harbour, lies, on the coast of Otok Kornat, about 6 cables north-westward of Tarac. For anchorage, *see* page 358.

Otočić Tovarnjak (Prišnjak), 39 feet (11^m9) high, lies nearly in mid-channel, about half a mile east-north-eastward of Otočić Obručan Veliki; a shoal, with a depth of 1½ fathoms (2^m7) over its outer end, extends 1½ cables north-eastward of the former islet. Two other shoals lie off Otočić Tovarnjak, one, with a depth of 5½ fathoms (9^m6) over it, at a distance of 2 cables south-eastward, and the other, with a depth of 2 fathoms (3^m7) over it, 2 cables northward and the same distance off Otok Kornat. Hrid Kalafatin lies about 1½ cables south-westward of the same islet (*Lat.* 43° 50' N., *Long.* 15° 14' E.). 30

Anchorage in Kornatski kanal.—The anchorage in Uvala Opat is described on page 342. 35

In Luka Žakan, there is anchorage for small vessels in the middle of the harbour, in depths of from 10 to 15 fathoms (18^m3 to 27^m4), sand, protected from all winds except the Bora; near the shore there are reefs.

In Uvala Lavsa, except during a Bora, there is good anchorage for small vessels over a bottom of sand. 40

Vessels can anchor in Luka Piškera during a Bora, northward of Otočić Panitula Mala, secured head and stern by hawsers to the shore. Southerly winds cause a steep, choppy sea in this harbour.

Uvala Guljak affords anchorage for vessels, protected from all winds, in a depth of 10 fathoms (18^m3), over a bottom of sand with patches of weed, north-eastward of Otočić Koritnjak. There are rocks ashore to which hawsers can be secured. 45

Small vessels can anchor off the village of Vrulje, over a sandy bottom, well protected from all directions. 50

There is well protected anchorage for small vessels in Uvala Modri Bok, over a reliable sandy bottom.

In Uvala Kravljačica, vessels of medium size can find good anchorage, in depths of from 6 to 11 fathoms (11^m0 to 20^m1); the best

Chart 2774.

anchorage for small vessels is eastward of Otočić Strižnjak, where they are sheltered from all directions.

Uvala Lojena affords temporary shelter during a Bora, over a bottom of sand and shingle.

Uvala Levrnaka affords shelter to small vessels over a bottom of sand, reliable holding ground, sheltered from all winds. There are rocks ashore to which hawsers can be secured.

In the south-eastern part of Uvala Bele Lučice there is good anchorage for small craft.

Chart 2774, with plan of Port Tajer.

South-western side of the northern end of Otok Kornat.—

Off-lying islets and dangers.—A bay is situated on the south-western side of Otok Kornat, from about one to 2 miles from the north-western extremity of that island (*Lat. 43° 53' N., Long. 15° 13' E.*); a group of four islets lies on the south-western side of this bay, the largest of which is Otočić Šilo Veliki, 210 feet (64^m0) high, lying with its southern end about a mile north-eastward of Otočić Obručan Mala, and its eastern side about 2½ cables off Otok Kornat; the positions of the other islets of this group can best be seen on the chart. Uvala Šipnata, in which there are some boat jetties, is situated in the south-eastern part of the bay. For anchorage, see page 359.

Otočić Sestrica Veliki, 184 feet (56^m1) high, lies about half a mile west-south-westward of Otočić Šilo Veliki. Otočić Sestrica Mala, 98 feet (29^m9) high, lies close off the south-eastern end of the former islet, with a depth of 5½ fathoms (10^m5) midway between. Otočić Aba Mala, 95 feet (29^m0) high, lies about 2 cables north-north-eastward of Otočić Sestrica Veliki, and Otočić Aba Veliki, 177 feet (54^m0) high, lies with its southern end about 2 cables farther north-north-eastward, and its north-eastern end about 2 cables off Suhi rt, on the coast of Otok Kornat, eastward, with a depth of 5½ fathoms (9^m6) midway between.

A shoal, with a depth of 5½ fathoms (9^m6) over it, extends a short distance from the south-western end of Otočić Aba Mala, and a shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 2½ cables north-westward of the same islet. The beacon, page 360, off the north-western side of Otočić Katina (Verige), bearing 013°, and open westward of the south-western extremity of that islet, leads westward of the latter shoal.

Otočić Dragunara (Dragonarica), 53 feet (16^m2) high, lies about 2 cables eastward of the southern end of Otočić Aba Veliki, connected to it by a bank, on which there is an above-water rock. A shoal, with a depth of 1½ fathoms (3^m2) over it, lies about 2½ cables northward of Otočić Dragunara and midway between Otok Kornat and Otočić Aba Veliki.

Uvala Tomasovac, which is shallow, lies between Suhi rt and the north-western extremity of Otok Kornat; there is a boat harbour on the southern side of this bay. For anchorage, see page 359.

Prolaz Proversa, which leads into the north-western end of Žutski kanal, is described on page 341.

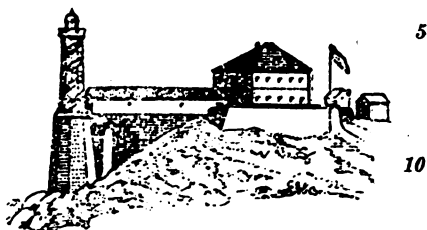
Uvala Katina, at the head of which there is a boat harbour, lies on the south-western side of the islet of that name, page 341. For anchorage, see page 359.

Charts 1440, 2158a.

Chart 2774, with plan of Port Tajer.

Light.—A light is exhibited, at an elevation of 156 feet (47^m5), from a white octagonal iron tower, painted with a red spiral band, and a dwelling, 85 feet (25^m9) in height, on the north-western end of Otočić Sestrica Veliki (*Lat.* 43° 51' N., *Long.* 15° 12' E.).

Anchorage.—Vessels of medium size can find good anchorage eastward of the northern end of Otočić Silo Veliki, in depths of from 7 to 9 fathoms (12^m8 to 16^m5), mud, good holding ground. Small craft can find shelter in Uvala Šipnata.



Otočić Sestrica Veliki lighthouse.

Large vessels can anchor in the middle of the area comprised between Otočić Katina, Otok Kornat, and Otočić Aba Veliki, in a depth of 19 fathoms (34^m7), sand. Small vessels, during a Bora, can anchor in the north-eastern part of Uvala Katina, over a bottom of sand, good holding ground; boulders are available for stern-fasts.

Small craft can anchor, during a Bora, in Uvala Tomasovac, over a bottom of mud, good holding ground.

Charts 2774, 2711.

DUGI OTOK.—This island, at its north-western end, consists of low, rocky land of whitish appearance; thence its height increases south-eastward in a range of ash-coloured, rocky hills, which are partly wooded and partly covered with thick bush; Vela Straža, the summit, 1,109 feet (338^m0) high, stands a short distance southward of the middle of the island. The only villages are situated on the north-eastern side; in the vicinity of habitations there are vineyards and olive groves.

The chief trade is in salt fish and salt, procured from a lake near Luka Telašćica.

See views facing page 353.

Chart 2774, plan of Port Tajer.

Luka Telašćica.—**General remarks.**—Luka Telašćica (Tajer) is entered between Rt Vidilica (Belvedere), the southern extremity of Dugi otok and Otočić Aba Veliki, 2½ cables north-eastward. The harbour, which consists of several basins communicating with each other, is surrounded by barren hills and is one of the best in this part of the Adriatic; it has space for a considerable number of vessels in depths varying from 7 to 33 fathoms (12^m8 to 60^m4), generally sand or mud. There is no village in its vicinity. *See view on chart 2774.*

Uvala Nozdre lies between Rt Vidilica and Rt Turčina, about 3½ cables northward. The south-easternmost basin is entered between the latter point and the south-western extremity of Otočić Katina, and is bounded, on its south-eastern side by that islet. Muravnjak (Moravjak), a hill, 489 feet (140^m0) high, lies on the south-western side of this basin.

The second basin is entered between a point, about 2½ miles westward of Rt Vidilica and Hrid Gozdenjak, 10 feet (3^m0) high, about 2 cables north-eastward. This rock lies near the end of a shallow spit which extends about a cable south-eastward from a point on the

Charts 1440, 2158a.

Chart 2774, plan of Port Tajer.

coast of Dugi otok. Uvala Tripuljak lies on the south-western side of this basin.

The third basin is entered between Rt Raknić, situated 6 cables westward of Hrid Gozdenjak, and the western entrance point of Uvala Tripuljak. Uvala Telaščica, the north-westernmost basin is entered between Ošlji rt (*Lat.* 43° 55' N., *Long.* 15° 09' E.), situated about a mile north-north-westward of Rt Raknić, and the south-western extremity of a peninsula, 121 feet (36^m9) high, about three-quarters
10 of a cable north-eastward.

In Luka Telaščica, the Bora blows strongly and from varying directions; strong southerly winds cause a considerable sea.

Harbour.—Islets and dangers.—Beacon.—A bank, with a depth of 1½ fathoms (3^m2) over it, extends about a cable south-eastward from
15 Rt Vidilica; the beacon off the north-western side of Otočić Katina, bearing 013°, and open westward of the south-western extremity of that islet, leads eastward of this bank. Hrid Taljurić (Tajer), 10 feet (3^m0) high, having a flat trencher-like appearance, lies about 2 cables west-south-westward of Rt Vidilica and 1½ cables offshore.

20 An above-water rock lies about a cable off the north-western side of Otočić Katina, in the south-western approach to Prolaz Proversa Mala, page 341; a square masonry beacon, 16 feet (4^m9) high, stands on a shoal about 1½ cables west-south-westward of this rock.

Otočić Korotan (Korolan), 43 feet (13^m1) high, lies in the middle
25 of the harbour, about 1½ miles north-westward of the south-western extremity of Otočić Katina; Hrid Galijola (Galiola), 13 feet (4^m0) high, lies about 1½ cables farther north-westward. A shoal, with a depth of 1½ fathoms (2^m7) over it, extends about half a cable from the north-western end of this rock. A rocky shoal, with a least depth of
30 3½ fathoms (6^m9) over it, lies about 3 cables north-westward of Hrid Galijola and from one to 1½ cables off the south-western side of the harbour.

A shoal, with a depth of 2½ fathoms (5^m0) over it, lies about 1½ cables south-eastward of Hrid Gozdenjak. A shoal, with a depth of 2 fathoms
35 (3^m7) over it, lies in the north-western part of Uvala Tripuljak, about 2½ cables southward of Rt Raknić. A salt water lake, about half a mile long, lies 1½ cables south-eastward of Uvala Tripuljak and a short distance inland.

Otočić Farfarikulac, 43 feet (13^m1) high, lies near the middle of the
40 third basin, about 3 cables south-eastward of Ošlji rt. Uvala Kruševica lies in the south-eastern part of this basin and Uvala Kučića Mul, where there are some boat jetties, in its northern part.

Banks extend from both sides of the entrance to Uvala Telaščica, leaving a narrow passage, in the fairway of which there is a depth of
45 about 9 fathoms (16^m5). A bank, with depths of less than 5 fathoms (9^m1) over it, extends about 3 cables from the head of this basin; the two barren Otočići Školji (Telego), the south-western of which is 210 feet (64^m0) high, and the north-eastern, 177 feet (53^m9) feet high, lie, close together, near the edge of this bank. There are boat jetties in
50 Uvala Draginjevica, on the north-eastern side of the basin, in Uvala Jaz (Telego), Uvala Pasjak, and Uvala Podugopolje, situated at the south-western end, on the western side, and at the north-western end, respectively, of the basin.

Anchorage.—Small craft can anchor in the south-western approach

Chart 2774, plan of Port Tajer.

to Prolaz Proversa Mala, either eastward or north-westward of the beacon previously mentioned.

Vessels can anchor with Otočić Korotan, bearing 296° , distant about half a mile, in a depth of 33 fathoms (60^m4), or about $2\frac{1}{2}$ cables northward of Hrid Galijola, in a depth of 29 fathoms (53^m0), sand. 5

There is good and completely sheltered anchorage in the southern part of Uvala Tripuljak, in depths of from 12 to 16 fathoms (21^m9 to 29^m3), sand.

Small vessels can anchor south-eastward of Otočić Farfarikulac (*Lat.* $43^{\circ} 55' N.$, *Long.* $15^{\circ} 09' E.$), in a depth of about 11 fathoms (20^m1). 10

Uvala Telaščica affords perfectly sheltered anchorage; there are depths of from 7 to 8 fathoms (12^m8 to 14^m6) south-eastward of Otočići Školji. Small craft can anchor in Uvala Pasjak or Uvala Podugopolje.

Directions.—A vessel entering Luka Telaščica, should pass westward of Otočić Sestrica Veliki and Otočić Aba Veliki, avoiding the bank extending from Rt Vidilica and the $5\frac{1}{2}$ -fathom (10^m1) patch, 4 cables south-eastward of that point, as previously directed. When the harbour opens, the chart is the best guide. The approach to Uvala Tripuljak is along the south-western side of the south-easternmost basin, passing south-westward of Otočić Korotan and Hrid Galijola, and avoiding the $3\frac{1}{2}$ -fathom (6^m9) and $2\frac{1}{2}$ -fathom (5^m0) shoals, previously mentioned. 20

Charts 2774, 2711.

South-western side of Dugi otok.—Islets and dangers.—The south-western side of Dugi otok is rocky and inaccessible, with few indentations. 25

Otočić Garmenjask Veliki, 131 feet (39^m9) high, lies about half a mile north-westward of Hrid Taljurić, page 360, and Otočić Garmenjask Mala, 75 feet (22^m9) high, lies about 2 cables farther north-westward; each of these islets is connected to the coast by a narrow bank with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it. 30

Chart 2711.

Otočić Mežanj (*Lat.* $44^{\circ} 06' N.$, *Long.* $14^{\circ} 55' E.$), 20 feet (6^m1) high, flat and partly covered with bush, lies about $5\frac{1}{2}$ miles south-eastward of Rt Veli rat, situated near the north-western end of Dugi otok; this islet is situated near the outer end of a shallow spit, extending three-quarters of a mile offshore. 35

Pličina Mišnjak, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it, lies about a mile south-eastward of Otočić Mežanj and $4\frac{1}{2}$ cables offshore. Uvala Brbiščica lies about 3 miles farther south-eastward. 40

Rt Lopata lies at the south-eastern end of a projection about $2\frac{1}{2}$ miles north-westward of Otočić Mežanj; Uvala Zakarun is situated on the north-eastern side of the projection; there is a boat harbour on the south-western side of this bay. 45

Chart 1561, plan of Maknare channel.

A bank, with depths of less than 5 fathoms (9^m1) over it, extends about a cable south-westward of Rt Veli rat; between this point and Rt Shajanje, about a mile north-eastward, the coast of Dugi otok is partly covered with trees. This strip of coast is bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, as much as 2 cables wide in places. 50

Otočići Lagnići, two in number and about a cable apart, lie about mile north-westward of Rt Veli rat. These islets are flat, of a whitish

Charts 1440, 2158a.

Chart 1561, plan of Maknare channel.

colour and thinly covered with grass ; the north-western islet is 10 feet (3^m0) high, and the south-eastern and larger is 7 feet (2^m1) high. They are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which extends about 1½ cables north-westward of the outer islet and about 4 cables north-eastward of the inner islet, where it is connected to the bank bordering the north-western end of Dugi otok by a ridge. There is a depth of 5½ fathoms (9^m6) in the fairway of the passage over this ridge. The light near the head of Uvala Lučina (Lat. 44° 13' N., Long. 14° 52' E.), Otok Molat, bearing between 050° and 057°, leads close north-westward of Otočići Lagniçi.

Pličina Bračić, with a depth of 2½ fathoms (5^m0) over it, rock, lies about 1½ cables north-westward of Rt Shajanje, and a 6-fathom (11^m0) rocky patch lies about 3½ cables farther north-westward.

15 **Light.**—A light is exhibited, at an elevation of 134 feet (40^m8), from a white circular tower with a green lantern, on a square base, with a dwelling, 133 feet (40^m4) in height, on Rt Veli rat. See view on chart 1561.

Charts 2774, 2711.

20 **Anchorage.**—Vessels may anchor for protection from a Bora, at a distance of from half a mile to 2 miles off the south-western side of Dugi otok, in depths of about 36 fathoms (65^m8), sand. The places ordinarily preferred are, from abreast Vela Straža to within about 3 miles south-eastward of Otočić Mežanj, and between the latter and Rt Veli rat. Farther south-eastward, the depths are considerable close inshore. The anchor should be weighed as soon as the gale permits.

Small craft can anchor in Uvala Brbišćica, during a Bora, but the depths are considerable and it is advisable to secure with hawsers to the shore. Anchorage in Uvala Zakarun is not recommended as the bottom is sandy and unreliable.

Chart 1561, plan of Maknare channel.

Luka Solišćica.—**Buoy.**—Luka Solišćica (Solinska), situated at the north-western end of Dugi otok, affords good shelter to vessels of any size from all except north-westerly winds, which cause a considerable sea ; it is entered between Rt Shajanje and the northern end of Otočić Bršćak, page 352, about 1½ miles north-eastward. A shoal, with a depth of 1½ fathoms (2^m7) over it, lies about 1½ cables westward of the northern end of Otočić Bršćak. Otočić Golac, lying about 40 2½ cables north-westward of Otočić Bršćak, is described on page 374.

There are depths of 21 fathoms (38^m4) about three-quarters of a mile from the head of Luka Solišćica, whence they gradually decrease, till, about a cable from its head, where the harbour becomes shallow.

The village of Soline, which contained 409 inhabitants, in 1931, lies at the head of the harbour. There is regular steamer communication with Olib and Šibenik.

There is a stone jetty on the north-eastern side near Soline. Uvala Lučina is situated on the western side of the head of the harbour.

On the south-western side of the harbour, Rt Oključić (Lat. 44° 10' N., Long. 14° 50' E.), the south-eastern extremity of a small peninsula, lies about 4 cables south-eastward of Rt Shajanje ; an above-water rock lies close off Rt Oključić on a shallow, rocky spit which extends half a mile south-eastward from that point, and continues about half a mile farther in that direction, with somewhat

Charts 2711, 1440, 2158a.

Chart 1561, plan of Macknare channel.

greater depths over it, as far as Rt Kobiljak ; Otočić Baričevac, 26 feet (7^m9) high, lies on this spit, about 1½ cables north-westward of Rt Kobiljak.

A black conical buoy, surmounted by a cone, is moored on the spit, 5 in a depth of 10 feet (3^m0), about 4 cables from Rt Oključić. The north-western and shallowest part of the spit is covered by the red sector of the light on Tanki rt, between bearings of from 146° to 189°.

Narrow passages, one on each side of Otočić Baričevac, lead into 10 Zaliv Pantera (Veli Rat) ; there is a depth of 4½ fathoms (7^m8) in the fairway of the north-western passage, and 3½ fathoms (6^m9) in that of the south-eastern, between the islet and Rt Kobiljak.

Uvala Lovka, where there are some boat jetties, lies between Rt Kobiljak and Tanki rt, about 4 cables westward. Uvala Sušica, where 15 there is a boat jetty, lies on the western side of Zaliv Pantera, about three-quarters of a mile west-north-westward of Tanki rt.

At the south-eastern end of Zaliv Pantera, a narrow passage, available only for small craft, leads into Uvala Čuna. The tidal streams in this passage, at times, attain a rate of 3 knots and are irregular. The 20 village of Veli Rat, in which there were 500 inhabitants, in 1931, lies on the south-western side of this passage. There is a small harbour here and a jetty to which small craft can secure. The village is in regular steamer communication with Olib and Šibenik.

Light.—A light is exhibited, at an elevation of 20 feet (6^m1), from 25 an iron column on a masonry base, 16 feet (4^m9) in height, on Tanki rt (*Lat.* 44° 09' N., *Long.* 14° 51' E.).

Anchorage.—**Directions.**—Large vessels can anchor at distances of from 3½ to 4 cables north-westward of the church in the village of Soline, in depths of from 12 to 16 fathoms (21^m9 to 29^m3), sand and 30 mud, good holding ground. Small vessels can anchor nearer the village and, in north-westerly winds, can find shelter in Uvala Lučica, in depths of from 5 to 8 fathoms (9^m1 to 14^m6).

Zaliv Pantera affords anchorage for small vessels in the north-western part, in a depth of 7 fathoms (12^m8), mud, sheltered from all winds 35 and sea.

Approaching Luka Solišćica, whether passing northward or southward of Otočići Lagnići, a good berth should be given to the coast between Rt Veli rat and Rt Shajanje. A vessel having opened Soline, should steer for it, avoiding the rocky spit off Rt Oključić. 40

Charts 2711, 1440, 2158a.

CHAPTER VIII

GULF OF QUARNARO AND ISLANDS.

Charts 2711, 2774.

GULF OF QUARNARO.—General remarks.—The waters contained between the coast of Yugoslavia and the coast of Istria, north-eastward of an imaginary line joining Rt Veli rat, at the north-western end of Dugi otok, and Capo Promontore (*Lat. 44° 46' N., Long. 13° 55' E.*), about 52 miles north-north-westward, are known as the Gulf of Quarnaro. This gulf is divided by islands into three main channels.

Planinski kanal, the easternmost, narrowest and longest of these channels, lies between the coast of Yugoslavia and a number of islands lying a short distance off, the largest of which are Pag, Rab and Krk.

Kvarnerić, called Il Quarnerolo by the Italians, the middle channel, lies between Otok Pag and Otok Rab, on its eastern side, and a group of islands, on its western side, the largest and northernmost of which is Isola Cherso; a number of islands lie near the south-eastern end of this channel, the largest of which is Otok Olib; farther south-eastward this channel leads into Zadarski kanal.

Il Quarnaro, called Kvarner by the Yugoslavs, the westernmost and widest of the channels, lies between the eastern coast of Istria and the group of islands lying off that coast, of which Isola Cherso is the northernmost.

The three main channels are connected by smaller channels between the numerous islands situated in the gulf.

Golfo di Fiume, called Riječki zaliv by the Yugoslavs, is situated at the head of the Gulf of Quarnaro.

For weather conditions, see page 15.

Several submarine cables, indicated on the charts, are laid in the Gulf of Quarnaro and it is necessary to avoid anchoring or bottom fishing in the vicinity of these cables.

The features included in this chapter are described in the following order:

Firstly. The channels leading into the south-eastern end of Planinski kanal between the mainland of Yugoslavia and Otok Vir and Otok Pag; the south-eastern end of Planinski kanal; Novigradsko More; and Karinsko More; pages 365 to 374.

Secondly. The islands lying at the south-eastern end of Kvarnerić, with the channels of approach from south-westward; Silbanski kanal; Olibski kanal; the channel between Otok Olib and Otok Maun; and Maunski kanal; pages 374 to 389.

Charts 1440, 2158a.

Charts 2711, 2774.

Thirdly. The western side of Kvarnerić from Otočić Gruica to Punta Coromasna (*Lat. 44° 47' N., Long. 14° 28' E.*), including Canale di Lussino; pages 389 to 395.

Fourthly. The eastern side of Kvarnerić from Rt Mišnjak (*Lat. 44° 30' N., Long. 14° 54' E.*) to Rt Kalifront, the western extremity of Otok Rab; Paški kanal; and Barbatski kanal; pages 396 to 401.

Fifthly. Planinski kanal from the south-eastern end of Otok Pag to the south-eastern end of Otok Rab; pages 401 to 406.

Sixthly. Kvarnerić, the western side from Punta Coromasna to 10 Punta Tarei (*Lat. 44° 57' N., Long. 14° 29' E.*); the eastern side from Rt Kalifront to Rt Tranjevo, on the south-western coast of Otok Krk (*Lat. 44° 59' N., Long. 14° 37' E.*), including the channels leading into Planinski kanal eastward; and the islets at the northern end of Kvarnerić, with the channels between; pages 406 to 411. 15

Seventhly. Planinski kanal from the south-eastern end of Otok Rab to the northern end of that channel; and Tihi kanal, leading from Planinski kanal into Golfo di Fiume; pages 411 to 420.

Eighthly. Krčki kanal; page 421.

Ninthly. Il Quarnaro; Canale della Faresina; pages 421 to 439. 20

Tenthly. Golfo di Fiume; pages 439 to 450.

Chart 2774.

COAST.—Rt Artić (*Lat. 44° 16' N., Long. 15° 07' E.*), page 326, the north-eastern entrance point of Zadarski kanal, is bordered by a shallow bank about 3 cables wide; this bank continues offshore to 25 the entrance of Privlački (Prevlaka) tesnac, about 1½ miles north-eastward. A shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 6 cables north-westward of Rt Artić. The village of Privlaka (Prevlaka), in which there is a conspicuous church, is situated close within the point. There is a small boat harbour close northward of 30 the village, formed by a mole extending north-westward, protected by a breakwater extending north-eastward. During south-easterly winds, small vessels can anchor off the mole in depths of about 3½ fathoms (5^m9).

Charts 2774, 2711.

A narrow ridge of sand, weed, shells and rock, with depths of less than 20 fathoms (36^m6) over it, lies with its south-eastern end about 3½ miles west-south-westward of Rt Artić and extends about 4 miles in a north-westerly direction. On this ridge, there are three detached banks, the south-eastern with a least depth of 8 fathoms (14^m6) over 40 it, and the north-western with a least depth of 6 fathoms (11^m0) over it.

Chart 2774.

Sidrište Privlaka.—**Anchorage.**—Sidrište Privlaka is situated in the bay which is entered between Rt Artić and Kozjak point, on 45 the southern side of Otok Vir, about 2 miles north-westward. A shoal, with a depth of 1½ fathoms (3^m2) over it, lies east-north-eastward of Kozjak point, near the edge of the coastal bank, which, with depths of less than 5 fathoms (9^m1) over it and a width of about 2½ cables, fringes the shores of the bay as far as the entrance to Privlački tesnac. 50

Large vessels can anchor three-quarters of a mile east-north-eastward of Kozjak point, about 4 cables offshore, in depths of from 9 to 12 fathoms (16^m5 to 21^m9), mud, good holding ground; here a vessel

Charts 1440, 2158a.

Chart 2774.

- is sheltered from winds from N.W., through north, to S.E.; south-westerly winds raise a considerable sea. In a Bora, small vessels can anchor in Dražica Prezida, half a mile northward of Rt Soline, the north-western entrance point of Privlački tesnac, where there are rocks ashore to which hawsers can be secured; the bottom here consists of sand and gravel, good holding ground. In a Scirocco, vessels can anchor half a mile north-north-westward of the village of Privlaka, in a depth of 8 fathoms (14^m6), off the entrance to Privlački tesnac.
- 10 The church in the village of Vir, about a mile north-north-eastward of Kozjak point, and Sveti Vid (Sulvid) chapel, on a hill, 66 feet (20^m1) high, on the mainland about 1½ miles east-north-eastward of Rt Artić, are conspicuous.

- Privlački tesnac.—Beacons.**—This is a narrow boat channel, about a mile long, between the mainland and the south-eastern end of Otok Vir and leads into the northern part of Ninski zaliv. The channel has precipitous sides, which, at the eastern end, nearly join. The depths in the channel are constantly changing and it should not be used without local knowledge. The fairway of this channel is marked by black beacons.

Telegraph cable.—A submarine cable, indicated on the chart is laid across Privlački tesnac near its western end.

Charts 2774, 2711.

- Otok Vir.—Light.**—Otok Vir is 380 feet (115^m8) high at its north-western end; towards the south-eastern end, it is low and partly wooded; the island can be distinguished by two bare, flat-topped hills. Between Kozjak point and Rt Pedinka, about 1½ miles westward, and for a distance of about three-quarters of a mile farther north-westward, the coast of the island is bordered by a narrow, shallow bank.
- 30 A light is exhibited, at an elevation of 22 feet (6^m7), from an iron structure on a concrete base, situated on the western coast of Otok Vir, about 1½ miles south-south-eastward of Rt Vir, the north-western extremity of the island (*Lat.* 44° 20' N., *Long.* 15° 01' E.).

- Anchorage.**—There are depths of 9 or 10 fathoms (16^m5 or 18^m3), mud, good holding ground, at a short distance offshore along the coast southward of Rt Vir. This locality is well protected by high land from the Bora. The anchorage recommended for a large vessel is, in depths of from 9 to 14 fathoms (16^m5 to 25^m6), rather more than 2 cables offshore, south-westward of Rasovača cove, situated close southward of the lighthouse.

Telegraph cable.—A submarine cable, indicated on chart 2711, is laid across Kvarnerić from a cable hut close northward of the lighthouse on Otok Vir to Otok Molat.

Chart 2774.

- 45 **Povljanski kanal.—Light.—Buoys.**—Povljanski (Nova Poljana) kanal is entered, from north-westward, between a point about half a mile east-north-eastward of Rt Vir and Hrastovac point, on the south-western side of Otok Pag, about 2½ miles farther east-north-eastward; at its south-eastern end, this channel leads into Ninski zaliv.
- 50 A shoal, with a depth of 6 fathoms (11^m0) over it, lies about 6 cables north-north-westward of the western entrance point. The south-western side of the channel is indented and fringed by a narrow, shallow bank. A bank, with a depth of 3 fathoms (5^m5) over it, extends about 2 cables off the eastern entrance point, and, from a

Charts 1440, 2158a.

Chart 2774.

position about a mile south-south-eastward of this point, the north-eastern side of the channel is fringed by a narrow, shallow bank.

The village of Velizal lies on the north-eastern side of the channel, about $1\frac{1}{2}$ miles south-eastward of Hrastovac point. Towards its south-eastern end, the channel narrows to a width of about 2 cables between the shallow banks extending from either side. There was, in 1946, a least depth of $4\frac{1}{2}$ fathoms (8^m7) in the fairway of this part of the channel, which is marked by buoys.

Pličina Artina, on the south-western side of the channel, extends from the south-eastern end of Otok Vir. Pličina Prutina, which is rocky at its north-western end, extends about $2\frac{1}{2}$ cables off the south-western side of Otok Pag from abreast Pličina Artina to Rt Prutina, the southern extremity of that island. A light-structure (*Lat. $44^{\circ} 18' N.$, Long. $15^{\circ} 09' E.$*) stands on the outer edge of the north-western part of this bank, and the south-eastern part of the bank is marked by a red conical buoy, surmounted by a cylinder.

A light is exhibited, at an elevation of 27 feet (8^m2), from a red iron framework structure on a square masonry base, 31 feet (9^m4) in height, on Pličina Prutina, about $1\frac{1}{2}$ miles west-north-westward of Rt Prutina and $2\frac{1}{2}$ cables offshore. This light is not visible over the south-eastern part of Prutina bank.

The current is north-west-going through this channel, its normal rate being about three-quarters of a knot, but at times, the current attains rates of from 3 to 4 knots.

H.M.S. *Coventry*, in 1934, passed through Povljanski kanal from Ninski zaliv without difficulty, having previously buoyed Pličina Artina.

Telegraph cable.—Beacons.—A submarine cable, indicated on the chart, is laid across the south-eastern end of Povljanski kanal. The shore ends of the cable are marked by beacons.

Anchorage.—Large vessels can anchor, in a Bora or in south-westerly winds, off Velizal, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), sand, good holding ground; they lie well sheltered here, but in a Bora should lay out a hawser ashore.

Bays between the mainland and the south-eastern end of Otok Pag.—Buoy.—Ninski (Nin) zaliv, in the mainland, is entered between the south-eastern entrance point of Privlački tesnac and Jasenova point, the north-western extremity of the peninsula of that name, 118 feet (36^m0) high, about $2\frac{1}{2}$ miles east-north-eastward. The shores of this bay are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, extending as much as half a mile offshore on its western side. Jasenova shoal extends about 4 cables off the point of that name; the north-western edge of this shoal is marked by a buoy with a top mark.

The small town of Nin is situated on a low islet in a swamp on the southern side of the bay. The village of Vrsi, on high ground, about $2\frac{1}{2}$ miles north-eastward of Nin, is conspicuous. For anchorage, see page 368.

Jasenova bay is situated north-eastward of the peninsula of that name, its north-eastern side being formed by the peninsula of Leporine, a narrow tongue of land, 82 feet (25^m0) high, which extends north-westward into the south-eastern part of Uvala Stara Povljana; the centre of this peninsula is low and covered at high water. Otočić

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Chart 2774.

Mišjak, 23 feet (7^m0) high, and surrounded by a bank, lies close off the north-western end of the peninsula. The sides of Jasenova bay are bordered by a narrow, shallow bank.

- 5 The chapel of Sveti Lovrenc stands at the south-eastern end of this bay and Gospa od Leporine, which is conspicuous, is situated near the extremity of Leporine peninsula. For anchorage, *see* below.

Uvala Stara Povljana (Poljana), in the south-eastern end of Otok Pag, is entered between Rt Prutina and the south-eastern extremity
10 of a peninsula extending south-eastward from Otok Pag, about 2 miles east-north-eastward. Otočić Paval, 72 feet (21^m9) high and partially covered with grass, lies close off the eastern entrance point, with Otočić Čikovac, 42 feet (12^m8) high and rocky, close south-eastward. A sunken rock lies close off the south-eastern end of each of these islets,
15 and two above-water rocks lie off the south-eastern side of Otočić Čikovac. There is a passage, with a depth of 3 fathoms (5^m5) in the fairway, and with steep cliffs on both sides, between Otočić Paval and Otok Pag, but off the south-western entrance, close to Otočić Paval, there is a shoal, with a depth of 5 feet (1^m5) over it. The passage
20 between the two islets is not recommended. This point with the islets, projects into the north-western part of Ljubački zaliv. Gradac cove, below the village of Smokvica, lies on the north-eastern side of Uvala Stara Povljana, about 1½ miles north-westward of the entrance. For anchorage, *see* page 369.

- 25 Ljubački (Ljubac) zaliv, in the mainland, is entered between Otočić Mišjak and Artina point (*Lat.* 44° 19' N., *Long.* 15° 16' E.), about 3½ miles east-north-eastward. This bay is divided into two by Rt Ljubina, Ljubac cove being situated southward of that point and Artina cove on its north-eastern side; the heads of both these coves
30 are shallow for a distance of about half a mile offshore. The village of Ljubač, which contained 326 inhabitants, in 1931, and which is situated on the northern side of Ljubac cove; the ruins of a castle on Rt Ljubina; and the house of Benići, about three-quarters of a mile south-eastward of Artina point, are conspicuous. For anchorage, *see*
35 page 369.

Vlašići cove and Uvala Dinjiška are situated in the south-eastern end of Otok Pag, between the peninsula forming the north-eastern side of Uvala Stara Povljana and the south-western entrance point of Ljubački tesnac, about 1½ miles north-eastward, and are separated by
40 Merta point. There is a small boat harbour in Vlašići cove, but this cove is not recommended as an anchorage on account of the violence of the Bora and Scirocco there. The head of Uvala Dinjiška is narrow, and shallow for a distance of about 1½ miles. South-eastward of the village of Dinjiška, situated on the north-eastern side of the bay, a
45 short distance from its head, there is a small mole for boats. For anchorage, *see* page 369.

- Anchorage.**—In Ninski zaliv, there is anchorage in a depth of 7 fathoms (12^m8), about a mile from the head of the bay and 6 cables off the eastern shore; small vessels can anchor farther in, about
50 3 cables offshore, in a depth of 4 fathoms (7^m3). The Bora blows very violently here.

Jasenova bay affords good shelter from all winds, in depths of from 4 to 7 fathoms (7^m3 to 12^m8); vessels of moderate size can anchor southward of the low ground on the north-eastern side of the bay,

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Chart 2774.

small vessels can anchor nearer the head of the bay. In a Bora, a hawser should be laid out to the shore.

In Uvala Stara Poveljana, there is well sheltered anchorage, in a Bora, on the north-eastern side of the bay, in Gradac cove or a mile east-south-eastward of it at an anchorage called Stanja; the holding ground is good and suitable boulders are available for hawsers ashore.

In Ljubački zaliv, there is anchorage, in depths of from 6 to 8 fathoms (11^m0 to 14^m6), mud, westward of the village of Ljubač; the holding ground is not very dependable, but the Bora and other winds do not blow very strongly here. In a Bora, there is anchorage, with good shelter, westward of the house of Benići, with a hawser to a boulder ashore. There is a narrow shore bank here, with a sunken rock close in.

H.M.S. *Coventry*, in 1934, anchored in Artina cove, over a bottom of thick, black mud, apparently good holding ground.

In Uvala Dinjiška, vessels can anchor on the north-eastern side, eastward of a projecting point, which is steep-to, about a mile northward of Merta point.

Ljubački tesnac.—Light.—Ljubački (Ljubac) tesnac is entered from southward between Rt Ljubač, situated about 4 cables north-north-westward of Artina point, and the southern extremity of a projection from the south-eastern end of Otok Pag, about a cable south-westward. The channel is narrow and winding, and, at its northern end, leads into Planinski kanal, between Rt Tanka Nožica, situated about half a mile north-eastward of Rt Ljubač, and a point about 3 cables west-north-westward. The land on each side is high and precipitous. A shallow bank extends about 2 cables northward of Rt Tanka Nožica.

The current in Ljubački tesnac is south-going, normally at a rate of about one knot but, at times, attaining rates of from 2 to 3 knots. H.M.S. *Coventry*, while anchored in the vicinity during September, 1934, reported that little or no current was experienced in this channel.

A vessel is recommended to keep Otok Pag aboard when entering Ljubački tesnac from northward.

A light is exhibited, at an elevation of 28 feet (8^m4), from an iron column with a stone base, 32 feet (9^m8) in height, on Rt Ljubač (*Lat.* 44° 19' N., *Long.* 15° 16' E.).

Regulations.—If a vessel is passing through Ljubački tesnac all other vessels must wait outside.

In clear weather, a vessel, or tug with a tow, before entering must sound *one long blast*. The vessel which first makes this signal has the prior right of entry.

If a vessel, or tug, is already navigating the channel, she must reply by sounding at least *four short blasts*.

South-eastern end of Planinski kanal.—Buoy and beacon.—The south-eastern end of Planinski kanal, formerly known as Montagna channel, is entered between Rt Tanka Nožica and Dugi rt about 2½ miles north-eastward; at its south-eastern end, this part of Planinski kanal narrows and leads into Maslenički kanal. The south-western side is backed by a range of hills which increase in height from a hill, 144 feet (43^m9) high, about three-quarters of a mile southward of Rt Tanka Nožica, to Brisnica (Goli brig), a hill, 820 feet (249^m9) high, about 10 miles south-eastward and 1½ miles inland; these hills slope gradually to the sea, in contrast to the high precipitous coast of the

Chart 2774.

opposite side. The north-eastern side of the channel is backed by a range of mountains about 5 miles inland, of which the principal peaks are Višerujna (Visujuna), 5,325 feet (1623^m1) high, about 6 miles east-north-eastward of Dugi rt, Vaganshi Vrh, 5,768 feet (1758^m1) high, about 2½ miles farther east-south-eastward, and Sveto Brdo, 5,752 feet (1753^m2) high, about 3½ miles farther south-eastward. In the south-eastern part, the mountains recede, leaving a level area which is cultivated.

- 10 The current, caused by the waters of Reka Zrmanja, page 373, often attains a considerable rate in this channel.

On the south-western side of the channel, Rt Debela Nožica lies about half a mile eastward of Rt Tanka Nožica. Hrid Orlic (*Lat.* 44° 19' N., *Long.* 15° 17' E.), barely visible, lies on a shallow spit which extends about 3 cables offshore, about three-quarters of a mile south-eastward of Rt Debela Nožica. Rt Dragunica lies about 3 miles south-eastward of Rt Debela Nožica; about midway between these two points, a 3-fathom (5^m5) bank extends a short distance offshore.

On the north-eastern side of the channel, Uvala Krušica Duboka (Krušćica) is situated on the eastern side of Dugi rt, with the village of Krušica, a port of call for local steamers, a short distance farther eastward. Sibuljina point, which can be identified by Tribanj chapel close above it, lies about 1½ miles south-eastward of Dugi rt. A rocky shoal, with a depth of 2 fathoms (3^m7) over it, lies about half a mile north-westward of Sibuljina point and 2 cables offshore, and a 3-fathom (5^m5) bank extends a cable offshore, a short distance eastward of this shoal.

Otočići Ražanci lie near the middle of Planinski kanal, Otočić Ražanac Veli, 36 feet (11^m0) high, the largest, being situated with its south-eastern end about 1½ miles north-eastward of Rt Dragunica; the other two islets are low, the smallest being situated on a shallow bank, which extends a short distance off the north-western end of the largest islet, and the westernmost at a distance of half a mile westward of that islet. A 3-fathom (5^m5) bank extends a short distance off the south-western side of the westernmost islet, and two detached patches, the western with a depth of 3½ fathoms (6^m4) over it, and the eastern with a depth of 2½ fathoms (4^m6) over it, the positions of which can best be seen on the chart, lie a short distance southward of the three islets.

On the south-western side of the channel, Uvala Dragunica lies on the south-eastern side of the point of that name, and the town of Ražance, which contained 1,219 inhabitants, in 1931, lies about 1½ miles south-eastward of the point; this stretch of coast is bordered by a narrow, shallow bank. At Ražance there is a shallow harbour for small craft, protected by a mole extending about half a cable north-westward from the coast.

The head of Zaliv Bokulja lies about 3½ miles south-eastward of Ražance and Jstocnjel point about 1½ miles farther north-eastward.

On the north-eastern side of the channel, the village of Starigrad lies close westward of Sveti Juraj chapel, about 5 miles south-eastward of Sibuljina point. At Starigrad there is a small quay, protected by a mole, for the local steamer. Rt Kula Veka, which is low and on which there is a ruined tower, difficult to distinguish, lies about a mile south-south-eastward of Starigrad; this stretch of coast is bordered

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Chart 2774.

by a shallow rocky bank, which is as much as 3 cables wide off Rt Kula Veća. The southern extremity of this bank is marked by a red conical buoy, surmounted by a cylinder. Reljan house, about $2\frac{1}{4}$ miles eastward of Rt Kula Veća, bearing 085° , and open southward of a white chapel, leads southward of this bank; the bank is also covered by the *red* sector of Vinjerac light, between bearings of from 129° to 189° . Between Rt Kula Veća and Jstocnjel point, the channel narrows. 5

Between Rt Kula Veća and Rt Pisak (*Lat.* $44^\circ 16' N.$, *Long.* $15^\circ 29' E.$), $1\frac{1}{4}$ miles south-eastward, there is a bight, the shore of which is bordered by a shallow bank. Rt Pisak is covered with olive trees, and a white chapel, northward of it, is conspicuous; on the western side of the point, there is a pier where small craft, with local knowledge can berth. In the mountains northward of Rt Pisak are the gorges of Velika and Mala Paklenica torrents. 15

On the southern side of the channel, the village of Vinjerac, which contained 900 inhabitants, in 1931, lies about three-quarters of a mile south-westward of Rt Pisak. Pličina Plitki Brak, with a depth of 5 feet (1^m5) over it, lies half a mile north-westward of Vinjerac and $2\frac{1}{4}$ cables offshore, and is marked, on its northern side, by an iron pole beacon, surmounted by two triangles, points together, and painted red and black, standing in a depth of 8 feet (2^m4). This shoal is covered by the *red* sector of Vinjerac light between bearings of from 129° to 189° . 25

A small harbour, protected by a mole extending south-westward from the northern end of the village, with a smaller mole a short distance southward of it, lies on the south-western side of Vinjerac; small craft, with local knowledge, can berth within the harbour, well protected from all winds, in depths of from 6 to 23 feet (1^m8 to 7^m0); the bottom consists of mud and sand, good holding ground. Outside the harbour, where the bottom is rocky, the anchorage is bad and exposed to the Bora. 30

At night, a vessel approaching Vinjerac from north-westward must keep the *white* sector of Vinjerac light in sight, bearing less than 129° , and approaching from eastward, should alter course southward as soon as Vinjerac light changes from *white* to *red* and steer for it on a bearing of about 189° . 35

Between Vinjerac and the northern end of Maslenički kanal, about $2\frac{1}{4}$ miles east-south-eastward, a number of detached banks, with depths of from $1\frac{1}{4}$ to $4\frac{1}{4}$ fathoms (3^m2 to 8^m7) over them, lie from $1\frac{1}{4}$ to $5\frac{1}{4}$ cables offshore. A vessel should pass northward of these banks. The extent of these banks can best be seen on the chart. 40

On the northern side of the channel, the coast from Rt Pisak for a distance of about $1\frac{1}{4}$ miles east-north-eastward, is bordered by a narrow, shallow bank; Skrapelj rock, with a depth of less than 6 feet (1^m8) over it, lies on the outer edge of this bank, about 6 cables eastward of Rt Pisak. 45

Tanka point, low and with a sunken rock close off it, lies about 2 miles eastward of Rt Pisak. Between Tanka point and Baljenica point, the north-eastern entrance point of Maslenički kanal, about a mile southward, there are some coves, but they are unsuitable for anchorage, being exposed to the Bora. 50

Lights.—A light is exhibited, at an elevation of 19 feet (5^m8), from

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an iron column, 18 feet (5^m5) in height, on Dugi rt (*Lat.* 44° 21' N., *Long.* 15° 18' E.).

A light is exhibited, at an elevation of 52 feet (15^m8), from a red iron tower on a stone base, 20 feet (6^m1) in height, on the south-eastern end of Otočić Ražanac Veli.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 15 feet (4^m8) in height, on the molehead in the harbour of Ražance.

10 A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 16 feet (4^m9) in height, on the molehead at Starigrad.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 17 feet (5^m2) in height, on the molehead at Vinjerac.

Anchorage.—Small craft can anchor off a small breakwater, northward of Rt Pisak and south-westward of Sveti Marko chapel, standing about 3½ cables north-north-eastward of the point; the bottom is sand and mud, and there are bollards in the vicinity. Sveti Marko chapel stands amongst trees and cannot easily be distinguished.

Telegraph cable.—A submarine cable, indicated on the chart, 20 is laid across this part of Planinski kanal. The north-eastern end of this cable is landed about half a mile eastward of Rt Pisak.

The description of Planinski kanal is continued on page 401.

Maslenički kanal.—Maslenički (Maslinica) kanal, entered from northward between Baljenica point, which is bare and of a yellowish brown colour, and Studena point, a short distance south-westward, 25 leads into Novigradsko More at its southern end. The channel has depths of from 10 to 18 fathoms (18^m3 to 32^m9) throughout, to within a few yards of its shores, which are from 50 to 100 feet (15^m2 to 30^m5) high. The land on the western side, near the shore and about half-way 30 along the channel, rises to an elevation of 338 feet (103^m0), and on the eastern side, to 374 feet (114^m0).

The northern entrance is encumbered with shoals, consequently the channel is not easy of access for large vessels. A rock, nearly awash, lies 45 yards (41^m1) from the western shore, about 2 cables within 35 Ždrijac point on the western side of the southern entrance.

In summer, northerly winds prevail in the channel during the day, and southerly winds during the night. Under normal conditions, the current is north-going through the channel at the rate of about one knot; southerly winds may increase the rate considerably.

40 **Novigradsko More.**—**Beacons and buoy.**—**Light.**—Novigradsko More is surrounded by well-wooded hills; the bottom consists of mud. It abounds in edible mussels and there is a tunny fishery.

Close westward of Ždrijac point, there is a short quay for small craft and an artificial harbour.

45 Maslenica cove, where there is a small artificial harbour, lies a short distance eastward of Ždrijac point; the northern coast abreast the latter point is steep-to and there are facilities for loading ore.

Uvala Posedarje, situated at the western end of the sea, is shallow, there being a depth of 3 fathoms (5^m5) at a distance of about 6 cables 50 from its head. The conspicuous chapel of Sveti Spiridona (Sveti Duh) stands on a rock close off the head of the bay. The village of Posedarje, which contained 758 inhabitants, in 1931, lies on the northern side of the bay and has a small artificial harbour; a channel, in the fairway of which there is a least depth of 9 feet (2^m7), leads to the

Chart 2774.

harbour and is marked by four posts, surmounted by discs, two of which mark the entrance and two the south-western side of the channel.

Small craft, with local knowledge, can anchor in a depth of about $2\frac{1}{2}$ fathoms (4^m6), sand, west-south-westward of an above-water rock lying close offshore, about $3\frac{1}{4}$ cables eastward of the village, or secure to the mole.

Luka Novigrad, on the southern side of the sea, is a narrow inlet with depths of about 9 fathoms (16^m5) at its entrance, gradually decreasing towards its head, from which depths of less than 3 fathoms (5^m5) extend for a distance of about a cable. Small craft can moor off the town to bollards on both shores. There is a quay for the use of local steamers. The Bora blows freshly, but the inner harbour is sheltered from the sea.

The town of Novigrad, which contains about 1,150 inhabitants, lies on the eastern side, near the head of the harbour.

A light is exhibited, at an elevation of 34 feet (10^m4), from an iron column on a concrete hut, on Rt Sveti Nikola, the eastern entrance point of the harbour (*Lat.* $44^\circ 11' N.$, *Long.* $15^\circ 33' E.$).

Žališće islet, low and flat, of a light colour and difficult to distinguish, lies on a shallow bank which extends a short distance off the north-eastern side of Novigradsko More, about $1\frac{1}{4}$ miles east-south-eastward of Ždrijac point.

The mouth of Reka Zrmanja lies about a mile south-eastward of Žališće islet; Rt Rijeka, the western entrance point, is marked by a buoy. On the eastern side of the mouth, a shallow spit extends a quarter of a mile offshore in a west-south-westerly direction; the outer edge of this spit is marked by a beacon.

Reka Zrmanja is navigable for small craft, with local knowledge, for a distance of about 6 miles, to the village of Obrovac. There is a least depth of 16 feet (4^m9) in the fairway of the channel which is marked by pole beacons, white on the starboard hand and black on the port hand, proceeding from Novigradsko More to Obrovac. The influence of the tide is felt as far as Obrovac and during normal times the rate of the tidal stream is not appreciable, but sometimes, during winter, a rate of 3 knots is attained.

Karinski kanal.—Anchorage.—Karinski (Karin) kanal connects Novigradsko More with Karinsko More and has depths in the fairway of from 6 to 10 fathoms (11^m0 to 18^m3). A reef, which uncovers at low water, lies about a mile south-south-eastward of the northern entrance of the channel, near the outer edge of a shallow bank which extends about 66 yards (60^m3) off a point, on the western side, where there is a sharp bend. The sides of the channel slope gently and are partly wooded.

Small vessels can find well sheltered anchorage, in all winds, over a bottom of mud, good holding ground, on the eastern side, northward of Sveti Kuzma chapel, situated about half a mile south-south-eastward of the northern entrance.

Karinsko More.—This sea is surrounded by high hills, which slope gently and are, on the eastern side, wooded. The western, southern and south-eastern sides are bordered by a bank; the bottom is rocky, in places, off the north-eastern side. On the southern side, at the mouth of the Karisnica river, stands the church of Sveti Franje (*Lat.*

To face page 375.

Suda Marija
church.

Tun Veli.



Rt Bonaster.

Straža.

Otočić
Golac.

Tun Mali.
Bršjak.

Otočić Lagnji.

Rt Veli rat lighthouse.

Uvala Lučina. *Sla. Marija church touching the end of the houses at Uvala Lučina, leads over Plućina Bonaster.*
Prolaz Maknare. *Approach to Prolaz Maknare from south-westward.*

(Original dated 1910.)

Zlatni Vrh.

Tun Veli.



Vrllac

Entrance,
bearing 225°.

Tun Mali.
Trala.

Kamenjak.

Otok Molat.

Molat.

Entrance to Prolaz Maknare from north-eastward.
(Original dated 1910.)

Silba.



Otok
Premuda.

Rt. Lopala.

Sveti Ante chapel,
in line with north-western
end of Hridi Gročeni,
bearing 018°.

Hridi
Gročeni.

Rt. Suha.

Otok
Škarda.

Passage between Otok Premuda and Otok Škarda.
(Original dated 1910.)

Chart 1561, plan of Maknare channel.

farther east-south-eastward; these two islets are connected by a shallow ridge. Otočić Bivošćak, 26 feet (7^m9) high and conspicuous because of its light colour, lies about a mile north-eastward of Stopanji rt; there is a depth of 6 fathoms (11^m0) a short distance north-north-westward of this islet. See view facing this page. 5

Dangers.—Pličina Bonaster, with a depth of 3 fathoms (5^m5) over it, lies about 2½ cables south-eastward of Rt Bonaster, and a rocky 5½-fathom (10^m1) patch lies about 3 cables south-south-westward of the same point. Both these dangers are covered by the *red* sector 10 of the light near the head of Uvala Lučina between bearings of from 050° to 057°. Pličina Bonaster is covered by the *red* sector of Tun Veli light bearing more than 099°. The 5½-fathom (10^m1) patch lies in the *white* sector of Tun Veli light between bearings of from 092° to 099°. 15

The 1½ fathom (2^m7) patch, about 1½ cables westward of the northern end of Otočić Bršćak, is mentioned on page 362.

On the north-western side of the passage, a shoal, with a depth of 5 fathoms (9^m1) over it, lies about 6 cables south-westward of Stopanji rt and 3 cables offshore. This shoal is covered by the *red* sector of 20 Tun Veli light bearing less than 213°.

The bank extending about 2 cables from the north-western end of Otočić Vrtlac is covered by the *red* sector of Tun Veli light bearing more than 223°.

The 5½-fathom (10^m1) patch lying about 3 cables north-westward 25 of Otočić Vrtlac lies in the *white* sector of Tun Veli light between bearings of from 213° to 223°.

Telegraph cable.—A submarine cable, indicated on the chart, crosses Prolaz Maknare from Dugi otok to Uvala Jakinska, on the southern side of Otok Molat. 30

Lights.—A light is exhibited, at an elevation of 29 feet (8^m8), from the window of a white house, on the south-eastern side of the head of Uvala Lučina, situated about 1½ miles north-eastward of Rt Bonaster (*Lat. 44° 12' N., Long. 14° 50' E.*).

The light on the north-western end of Otok Tun Veli is described 35 on page 351.

Tidal streams.—Between Otok Tun Veli and Otočić Tun Mali, the tidal stream, during a rising tide, is east-going with a maximum rate of 2½ knots, and between Otok Tun Veli and Otok Sestrunj it is north-going. During a falling tide, these directions are reversed 40 and the maximum rate is 1½ knots.

Directions.—A vessel proceeding through Prolaz Maknare to Zadarski kanal should bring the southern extremity of Otočić Tun Mali to bear 090°, on which bearing the northern extremity of Otok Tun Veli should not be visible; this course leads between Otočić 45 Golac and the rocky 5½-fathom (10^m1) patch lying south-south-westward of Rt Bonaster; see view on chart 1561. She should then pass through Velo Žaplo, between Otok Tun Veli and Otočić Tun Mali. When through this passage, the north-western extremities of Otok Zverinac and Otok Tun Veli should be brought in line, astern, bearing 50 216°, to lead nearly midway between Otočić Vrtlac and Otočić Trata; in this part of the passage, the tidal stream must be taken into consideration.

A vessel may pass between Otočić Vrtlac and Otok Sestrunj, but

Chart 1561, plan of Maknare channel.

must avoid the rocky spit extending about 2 cables from the latter island about 4 cables south-south-westward of Rt Križa, mentioned on page 351; southward of Otočić Vrtlac and in this channel, there are
 5 heavy tide rips during the rising tide.

At night, the position of Prolaz Maknare is indicated at a considerable distance by the light on Rt Veli rat, page 362, and, on a nearer approach, by the *red* sector of Uvala Lučina light, and also by the light on Otok Tun Veli. The light at Uvala Lučina, which is visible between
 10 bearings of from 050° to 057° only, leads north-westward of Otočić Lagniči.

To enter the passage from westward, a vessel should steer for Tun Veli light, keeping in the *white* sector of that light between bearings of from 092° to 099°; the 5½-fathom (10^m1) patch, 3 cables south-south-
 15 westward of Rt Bonaster, lies in this sector and should be avoided by a vessel of deep draught, by passing either northward or southward of it.

Having passed through Velo Žaplo, a vessel should steer north-eastward for the light on Otok Vir (chart 2711), keeping in the *white* sector of Tun Veli light between bearings of from 213° to 223°, which leads
 20 between Otočić Vrtlac and Otočić Trata; the 5½-fathom (10^m1) patch, 3 cables north-westward of Otočić Vrtlac, lies in this sector and must be avoided by a vessel of deep draught. When the south-easternmost of Otočići Tri Sestrice (chart 2711), page 327, is seen, bearing about 140°, course may be altered as desired; if bound south-eastward, care
 25 must be taken to avoid Rivanjska pličina, page 327.

Brguljski zaliv.—Anchorage.—Brguljski (Brgulje) zaliv, on the southern side of Otok Molat, is formed by a tongue of land terminating in Rt Bonaster (*Lat. 44° 12' N., Long. 14° 50' E.*) and is well sheltered; the bay is seldom used except by small vessels.

30 Uvala Jakinska is situated on the eastern side of the bay, about three-quarters of a mile north-westward of Rt Žaplo, the eastern entrance point; there are two boat jetties in this cove, but anchorage is prohibited on account of the submarine cable previously mentioned.

Uvala Lučina lies about half a mile farther north-westward. There
 35 are a mole and some jetties in this cove and there is regular steamer communication with other ports in Yugoslavia. The village of Molat, which contained 504 inhabitants, in 1931, is situated a short distance eastward of the head of Uvala Lučina; Sveta Marija church, westward of the village, is conspicuous. The light at the head of this cove is
 40 described on page 375.

Uvala Podgarbe, in the north-western part of which there is a boat jetty, lies about half a mile north-westward of Uvala Lučina.

The islet of Školjić, or Brgulje, situated in the north-eastern part of the bay, is connected with the coast by a rocky bank; small craft,
 45 with local knowledge, can use the passage, in the fairway of which there is a depth of 2½ fathoms (4^m6), between the islet and the coast. Eastward of this islet there is a boat harbour and along the coast there are a few houses and vineyards; the village of Brgulje lies about half a mile eastward of the boat harbour.

50 Vrulje cove is situated northward of Školjić and Port Luka lies at the head of Brguljski zaliv.

There is anchorage in the middle of the bay, in a depth of 21 fathoms (38^m4), mud, about 3½ cables southward of Školjić. Small vessels can find shelter, against all winds in Uvala Lučina; in the south-eastern

Charts 2711, 1440, 2158a.

Chart 1561, plan of Maknare channel.

part of Uvala Podgarbe, during a Bora or Scirocco, but this cove is exposed to south-westerly winds; and in Port Luka, against the Bora, over a bottom of sand, good holding ground. Southerly winds cause a considerable sea in Port Luka.

Directions.—A vessel bound for Brguljski zaliv should follow the directions for entering Prolaz Maknare until well past Otočić Golac, when she should alter course northward into the bay, giving Rt Bonaster a berth of at least 4 cables in order to avoid Pličina Bonaster; or, if intending to pass northward of that rock and the $5\frac{1}{2}$ -fathom (10^m) patch, half a mile south-westward of it, she should round Rt Bonaster at a distance of $1\frac{1}{2}$ cables, so as to pass midway between the rock and the point, thence she should alter course as desired. See view on chart 1561 and view facing page 375.

*Charts 1561, plan of Maknare channel, 2711.***Western side of Otok Molat.—Off-lying islets and dangers.**

Beacon.—Between Rt Bonaster and the north-western extremity of Otok Molat, about 4 miles north-north-westward, the western side of the island is almost straight. Prisika cove, at the head of which there is an isthmus, lies about $1\frac{3}{4}$ miles north-north-westward of Rt Bonaster; and about 2 cables southward of the north-western extremity of the island, there is a small projection.

Several islets, rocks and shoals lie off the western side of Otok Molat, of which Otočić Tramerka, previously mentioned, is the largest. Pličina Bačvica (Bačva), with a depth of less than 6 feet (1^m) over it, and which breaks, lies about half a mile south-eastward of Otočić Tramerka and Galiola shoal, with a depth of 2 fathoms (3^m) over it, lies about $4\frac{1}{2}$ cables north-north-westward of the western extremity of the same islet. Otočić Tramerčica, 141 feet (43^m) high, lies about midway between the southern end of Otočić Tramerka and the coast of Otok Molat eastward.

Otočić Obljak, 98 feet (29^m) high, lies about 4 cables north-eastward of Otočić Tramerka. A $4\frac{1}{2}$ -fathom (8^m) patch lies 2 cables south-eastward, and a similar patch, about a cable westward of Otočić Obljak; and a rocky shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m) over it, lies about 6 cables north-north-westward of the same islet. Maslinjak, an islet, 120 feet (36^m) high, with a $3\frac{1}{2}$ -fathom (6^m) patch, about $3\frac{1}{2}$ cables south-westward of it, lies about $1\frac{1}{2}$ miles north-north-westward of the western extremity of Otočić Tramerka (*Lat.* $44^\circ 14' N.$, *Long.* $14^\circ 46' E.$).

Chart 2711.

A bank, with a depth of 6 fathoms (11^m) at its outer end, extends about 2 cables north-north-westward of Maslinjak.

Otočić Galijola (Galiola), 26 feet (7^m) high, lies about 7 cables westward of the southern end of Maslinjak.

Kamenjak, an islet, 69 feet (21^m) high, lies 4 cables eastward of Maslinjak, and Knežacić, an islet, 39 feet (11^m) high, lies about a mile farther eastward; a sunken rock lies on a bank which extends a short distance south-eastward of Knežacić, and to within about $1\frac{1}{2}$ cables of the coast of Otok Molat.

A shoal, with a depth of 7 feet (2^m) over it, marked by a pole beacon, 10 feet (3^m) high, surmounted by a ball, lies about half a mile westward of the north-western extremity of Otok Molat. This shoal lies in the western approach to Prolaz Zapuntel, page 378.

Charts 1440, 2158a.

*Chart 1561, plan of Maknare channel.***North-eastern side of Otok Molat.—Islets and dangers.—**

Biljavka point lies about three-quarters of a mile north-westward of Stopanji rt, page 374; a rock, with a depth of $4\frac{1}{2}$ fathoms (8^m2) over it, lies on the outer edge of a bank, which extends about 2 cables off the northern side of Biljavka point. Konopljika (Konoplička) cove, where the submarine cable from Otok Vir, mentioned on page 366, is landed, lies on the southern side of Biljavka point. There are some boat jetties at the head of this cove, which is shallow. Rt Glavica lies about a mile north-westward of Biljavka point, with Vopojni cove on its eastern side.

Luka Jazi is entered between Rt Glavica and Lipić point, about three-quarters of a mile westward. Brgulje, an islet, 19 feet (5^m8) high, lies on the end of a shallow spit which extends 2 cables northward of Lipić point.

Otočić Tovarnjak (Tovarjak), 78 feet (23^m8) high, lies in the approach to Luka Jazi, with its south-eastern end about 4 cables north-north-westward of Rt Glavica; the south-western side and south-eastern end of this islet are bordered by a narrow, shallow bank.

The sides of Luka Jazi are bordered by a shallow bank, which is about $1\frac{1}{2}$ cables wide at the south-eastern end of the harbour, where there are some jetties, one of which is furnished with bollards. A tower on Rt Glavica, the pine forest at the head of the harbour and the red church tower in the village of Molat are conspicuous. For anchorage, see below.

Between Lipić point and a point, about $1\frac{1}{2}$ miles north-westward, there are three coves, all of which are exposed to the Bora.

Chart 2711.

A shallow bank extends about a quarter of a mile eastward and northward of the point just mentioned. Hrid Šašica (Lusnjak), 18 feet (5^m5) high, lies on the eastern end of this bank, and Hrid Hripnjak, 2 feet (0^m6) high, on the northern end. A rocky shoal, with a depth of 2 fathoms (3^m7) over it, lies about half a mile north-eastward of Hrid Šašica. Otočić Rižnjak, 26 feet (7^m9) high, of a yellow colour and covered with grass, lies about $5\frac{1}{2}$ cables north-north-eastward of Hrid Hripnjak.

An above-water rock lies close offshore about 4 cables westward of Hrid Hripnjak, and Rt Vranač, the northern extremity of Otok Molat, lies about a mile farther north-westward.

Light.—A light is exhibited, at an elevation of 42 feet (12^m8), from a red conical iron tower on a stone base, 27 feet (8^m2) in height, on Rt Vranač (*Lat.* $44^\circ 16' N.$, *Long.* $14^\circ 48' E.$).

Chart 1561, plan of Maknare channel.

Anchorage.—In Luka Jazi, there is good anchorage, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), mud, sheltered from the Bora, about a quarter of a mile south-westward of Otočić Tovarnjak. Vessels anchoring farther southward within the harbour are also sheltered from south-easterly and south-westerly winds.

Prizina cove, on the south-western side of the harbour, affords good anchorage for small craft.

Approaching Luka Jazi, a vessel can pass on either side of Otočić Tovarnjak.

Chart 2711.

Prolaz Zapuntel.—This passage, which separates Otok Molat

Charts 1440, 2158a.

Chart 2711.

from Otok Ist, north-westward, is very narrow at its western end ; at its eastern end, between Rt Vranač and the south-eastern extremity of Otok Ist, it is about 3 cables wide. There are depths of 3 fathoms (5^m5) in the western entrance ; about 3 cables eastward of this entrance, the depths in mid-channel become greater. The shores are bordered by a bank.

The harbour of Zapuntel, where there are some boat jetties in shallow water, is situated in the eastern part of the passage. This harbour affords good anchorage for small craft ; the centre part is exposed to the Bora, but elsewhere there is shelter from all winds. The tidal streams in the passage sometimes attain rates of from 2 to 3 knots.

There is regular steamer communication with Olib and Preko.

Telegraph cable.—A submarine cable, at each end of which there is a cable house, crosses Prolaz Zapuntel at its western end.

Otok Ist.—**Off-lying islets and dangers.**—Otok Ist, close north-westward of Otok Molat, is nearly divided in two by bays, one on its south-eastern side and one on its north-western side. It is formed by two hilly ranges with low land between, and has the appearance of two islands, when seen from north-westward. Straža, a hill, 570 feet (173^m7) high, with the conspicuous chapel of Sveti Gospa on it, is the summit of the island and is situated on the north-eastern side. The south-western ridge rises to an elevation of 535 feet (163^m1).

The south-western and north-eastern sides of Otok Ist are steep and thickly covered with bush ; the more gentle slopes of the island, especially the southern slopes of Straža hill, are either cultivated or wooded.

Široka bay, on the south-eastern side of the island, is open southward and unsuitable for an anchorage ; the bottom consists of sand and is unreliable. Depths of less than 5 fathoms (9^m1) extend about half a mile from the head of the bay. Otočić Benušić, with a tower on it, lies about 2 cables south-eastward of the southern entrance point, with a depth of 3½ fathoms (5^m9) between it and the point.

The village of Ist, which contained 476 inhabitants, in 1931, lies on the eastern side of the head of Široka bay ; the church steeple in the village is conspicuous. Off the village, there is a small harbour protected by a mole, where small vessels, with local knowledge, can berth.

Ist is in regular steamer communication with Sušak and Šibenik.

A vessel entering Široka bay must avoid the shoal in the western approach to Prolaz Zapuntel, previously mentioned.

A number of islets and dangers lie off the south-western side of Otok Ist. Otočić Dužac (*Lat.* 44° 15' N., *Long.* 14° 44' E.), 33 feet (10^m1) high, lies about 4 cables north-north-westward of Otočić Galijola and three-quarters of a mile off the coast of Otok Ist. An above-water rock lies 2½ cables eastward of Otočić Dužac and Crnikova, an islet, 49 feet (14^m9) high, lies about half a mile farther eastward and 1½ cables offshore.

Otočić Vodinjak, 85 feet (25^m9) high, with a tower on its northern side, lies about half a mile northward of Otočić Dužac ; midway between these two islets are the two Otočići Sestrice, 20 feet (6^m1) high, situated on the western end of a shallow bank, about 4 cables long, lying parallel with Otočić Vodinjak.

Turtula cove, exposed to the Bora and not a good anchorage, lies on the north-eastern side of Otok Ist, about half a mile north-westward

Charts 1440, 2158a.

Chart 2711.

of the south-eastern extremity of the island ; a sunken rock lies close off the southern side of this cove about $2\frac{1}{2}$ cables eastward of its head.

The navigation of the channel between Otok Ist and Otok Škarda, about $3\frac{1}{4}$ cables westward, is complicated by the islets and dangers in the approach to its entrance, as well as by the rapidity of the tidal streams through it. A vessel, approaching this channel from south-westward, should pass westward of all the islets and dangers lying off the south-western side of Otok Ist, but Otočić Vodinjak should be closed so as to avoid the $4\frac{1}{2}$ -fathom (7^m8) patch, lying about $2\frac{1}{2}$ cables off Satrin point, the southern extremity of Otok Škarda.

Uvala Kosirača, on the north-western side of Otok Ist, lies south-westward of Rt Kok, the northern extremity of that island. Sika Križice shoal, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, and steep-to, lies about three-quarters of a mile west-north-westward of Rt Kok and the same distance north-eastward of Otok Škarda.

Telegraph cable.—A submarine cable, indicated on the chart, is laid from the northern end of Otok Ist to Otok Silba.

Light.—A light is exhibited, at an elevation of 18 feet (5^m5), from a green iron column, 16 feet (4^m9) in height, on the mole head at Ist (*Lat. $44^{\circ} 16' N.$, Long. $14^{\circ} 46' E.$*).

Anchorage.—In Uvala Kosirača, vessels of moderate size can find shelter from south-easterly and south-westerly winds, but the Bora blows with violence. The bottom consists of sand and mud, good holding ground. A vessel entering this bay can avoid Sika Križice shoal by keeping either Otok Ist or Otok Škarda aboard.

Otok Škarda.—Dangers.—Otok Škarda is mostly covered with thick bush and is sparsely inhabited; the summit, at the south-eastern end, is 335 feet (102^m1) high. On the northern side are seen Sveti Andrija chapel, some houses and cultivation. Griparica cove lies on the south-eastern side of the island. A bank, with a depth of 3 fathoms (5^m5) over it, extends a short distance south-westward from the southern extremity of the island and the north-western end of the island is bordered by a similar bank. A shoal, with a depth of $3\frac{1}{4}$ fathoms (6^m9) over it, lies about 6 cables south-westward of Rt Suha, the north-western extremity of the island.

Otok Škarda is connected, at its north-western end, with Rt Lopata, the south-eastern extremity of Otok Premuda, by a ridge, with depths of less than 10 fathoms (18^m3) over it, and steep-to. Depths of less than 5 fathoms (9^m1) extend $2\frac{1}{4}$ cables south-eastward of Rt Lopata, and two patches, each with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, lie on the ridge at distances of about 3 and 6 cables, respectively, from that point. The channel, between the coastal banks on either side, is about three-quarters of a mile wide, but the rapidity of the tidal streams over the ridge frequently makes navigation difficult. A mid-channel course should be steered. Sveti Ante chapel, on Otok Silba, in line with the north-western extremity of Hridi Grebeni, bearing 018° , leads over the ridge in a depth of $6\frac{1}{2}$ fathoms (11^m9) ; care must be taken not to mistake the lighthouse-keeper's house, on the southern entrance point of Luka Sveti Ante, for the chapel. See view facing page 375.

Anchorage.—Griparica cove affords good shelter in northerly winds to vessels of moderate size, but it should be quitted on the first sign of south-easterly weather, as the Scirocco causes a heavy sea.

Charts 1440, 2158a.

Chart 2711.

Telegraph cable.—A submarine cable, indicated on the chart, is laid near the middle of the channel between Otok Škarda and Otok Premuda.

Otok Premuda.—This island is 295 feet (89^m9) high near the middle; it is thickly covered with bushes, except in the neighbourhood of the village of Premuda, which lies towards the north-western end of the slope of the summit, and which, in 1931, contained 374 inhabitants. On a near approach, the church tower in the village and the chapel of Sveti Kirijsko, close to Luka Krijal, are conspicuous. *10*
Chart 1561, plan of Port Krijal.

Premuda cove is situated on the south-western side of Otok Premuda about 2½ miles north-westward of Rt Lopata (*Lat. 44° 18' N., Long. 14° 40' E.*).

Luka Krijal, about a mile north-westward of Premuda cove, lies on the north-eastern side of a channel formed by a reef, which is about a mile long and steep to on its south-western side, lying parallel with the coast, at a distance of about 2 cables offshore. On this reef there are several above-water, bare rocks of which the principal, from south-eastward, are Bračić, Plitka, Masarine and Hripa; these rocks are *20*
3, 18, 27 and 28 feet (0^m9, 5^m5, 8^m2 and 8^m5) high, respectively, and there is no passage between them. One above-water rock lies, detached, close off the south-eastern end of the reef.

Luka Krijal is protected by two moles which are furnished with bollards. North-westerly winds cause a considerable sea, but, during southerly winds, although the force may be strong, the reef breaks the force of the sea. Southerly winds cause a strong north-west-going current in the channel. *25*

Hrid Masarine is connected to the coast, abreast the harbour, by a bar, across which there is a narrow winding channel, with a depth of *30*
2½ fathoms (5^m0) in the fairway. The north-eastern side of the reef is bordered by a bank, which, at a distance of about 2 cables southward of the harbour, is about 1½ cables wide and has a depth of 1½ fathoms (3^m2), rock, at its outer edge.

During a Bora, the local steamer calls at Luka Krijal instead of Uvala Loza, on the north-eastern side of the island. *35*

Chart 2711.

Otočić Kamenjak, 75 feet (22^m9) high, lies about a cable northward of Zubić point, the north-western extremity of Otok Premuda, with a depth of 4 fathoms (7^m3) between them. *40*

Charts 1561, plan of Port Krijal, 2711.

Lights.—A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 18 feet (5^m5) in height, on the northern molehead at Luka Krijal.

A light is exhibited, at an elevation of 39 feet (11^m9), from a red iron tower, 28 feet (8^m5) in height, on the northern end of Otočić Kamenjak. *45*

Anchorage.—Vessels of any size can anchor under the south-western side of Otok Premuda during a Bora. Large vessels should anchor in a depth of about 33 fathoms (60^m4), sand, about 1½ miles offshore and the same distance southward of Hrid Masarine, or off Premuda cove, about 2 cables offshore, in depths of from 27 to 32 fathoms (49^m4 to 58^m5). *50*

In Premuda cove, where the bottom consists of sand, there is anchorage for small vessels with offshore winds; a single vessel of moderate

Charts 1440, 2158a.

Charts 1561, plan of Port Krijal, 2711.

size can find good shelter, in a Bora or Scirocco, in the south-eastern part of this cove. A vessel entering this cove must avoid the above-water rock lying, detached, off the south-eastern end of the reef fronting Luka Krijal, previously mentioned.

Off Luka Krijal, there is anchorage in a depth of $3\frac{1}{2}$ fathoms (6^m4), sand, good holding ground, about a cable south-eastward of Sveti Kirijako chapel, but this anchorage is constricted by the rocky bank extending from Hrid Masarine, previously mentioned. The anchorage, with winds from the eastern semicircle, is north-westward of the chapel, and, with other winds, south-eastward; in the former case small vessels, with local knowledge, can lie off the chapel and larger vessels, north-eastward of Hrid Hripa, in a depth of about 7 or 8 fathoms (12^m8 or 14^m6).

15 Chart 2711.

Western approach to Silbanski kanal.—Otočić Lutrošnjak, 62 feet (18^m9) high, is situated about 3 cables north-westward of the northern end of Otočić Kamenjak; it is bordered by a bank which extends as much as a quarter of a mile from its south-western side. The channel between these two islets leads into Silbanski kanal. On the south-eastern side of the channel, there is a bay, with a rocky bottom, between Otočić Kamenjak and Medvjak point, the northern extremity of Otok Premuda. A bank, with depths of less than 5 fathoms (9^m1) over it, extends about 2 cables north-westward from Medvjak point; at night, the light on Otočić Kamenjak is visible over this low point.

Otočić Lutrošnjak is the southern boundary of the principal channel leading from the open sea into Kvarnerić. Otočić Gruica, with a lighthouse on it, lies about $2\frac{1}{4}$ miles northward of Otočić Lutrošnjak.

The passage between these two islets leads into the northern end of Silbanski kanal. An 8-fathom (14^m6) patch, which is steep-to, lies about a mile north-westward of Otočić Lutrošnjak.

Silbanski kanal.—**Anchorage.**—**Buoy.**—Silbanski (Silba) kanal is entered from south-eastward between Rt Lopata (*Lat. $44^\circ 18' N.$, Long. $14^\circ 40' E.$*), page 380, and Rt Južni Arat, the southern extremity of Otok Silba, about $3\frac{1}{2}$ miles north-eastward. It is the direct route from Zadarski kanal to the western coast of Istria and Trieste; in its south-eastern part, when on that route, a vessel should close the western coast of Otok Silba.

The south-eastern approach to Silbanski kanal is divided into two channels by two groups of above-water rocks. Hridi Križice, two in number, about $1\frac{1}{2}$ cables apart, lie with the smaller and south-eastern rock, about three-quarters of a mile north-westward of Rt Kok, the northern extremity of Otok Ist; the larger and north-western rock is 62 feet (18^m9) high. Hridi Grebeni (Grebenj) lie from about one mile to $2\frac{1}{4}$ miles north-westward of Hridi Križice, nearly midway between the south-eastern end of Otok Premuda and Otok Silba. They consist of three dark, barren, steep and narrow rocks, from 128 to 170 feet (39^m0 to 51^m8) high. A bank, with depths of less than 5 fathoms (9^m1) over it, extends a short distance off the south-eastern end of the rocks, and a shallow spit, with an above-water rock on it, extends about 2 cables off their north-western end. Two detached shoals, each with a depth of one fathom (1^m8) over it, lie about $3\frac{1}{2}$ and 6 cables, respectively, north-westward of Hridi Grebeni.

Charts 1440, 2158a.

Chart 2711.

On the south-western side of the channel, the coast of Otok Premuda is precipitous, is steep-to and affords no shelter. Uvala Loza, exposed to northerly and north-westerly winds, lies about three-quarters of a mile south-south-eastward of Medvjak point, under the village of Premuda. On the southern side of this bay, there is a boat harbour. Except during a Bora, Uvala Loza is in steamer communication with Olib, Preko and Šibenik. See page 381.

On the north-eastern side of the channel, the coast between Rt Južni Arat and Rt Mavrova, about three-quarters of a mile north-westward, is bordered by a bank which is as much as $1\frac{1}{2}$ cables wide off the former point. Luka Sveti Ante is entered between Rt Mavrova and a point, close off which there is a stone bollard, about $3\frac{1}{2}$ cables north-westward. A shallow bank extends a short distance from each of these points. This harbour serves as a place of refuge for small vessels in a Bora. At the head of Luka Sveti Ante, there are two coves, in the northern of which there are a boat harbour and some stone bollards to which vessels can secure, in a depth of 3 fathoms (5^m5), mud, sand, weed and good holding ground. During southerly winds, the eastern cove is better for anchorage. Westerly winds cause a heavy sea. Sveti Ante chapel, at the head of the harbour is conspicuous.

Sidrište Žalić is situated in a bay on the western side of Otok Silba, between a point, about three-quarters of a mile north-north-westward of Luka Sveti Ante, and a point about 2 miles farther north-westward. The shores of the bay are bordered by a narrow bank. Sidrište Žalić affords anchorage in a Bora for vessels of any size. The best berth is in depths of from 15 to 23 fathoms (27^m4 to 42^m1), sand, not very good holding ground, at a distance of between 3 and 4 cables offshore, with Silba church bearing 097° . Near the coast, the bottom is rocky.

The village of Silba, which contained 754 inhabitants, in 1931, occupies the whole width of the low part of the island and has two conspicuous church steeples.

Luka Žalić is situated about $1\frac{1}{2}$ miles north-north-westward of Rt Mavrova. Here there is a mole, alongside which small vessels, with local knowledge, can berth. A short distance north-westward of the molehead, a cylindrical buoy, surmounted by a diamond, marks the remains of a breakwater; a vessel should not pass between the buoy and the coast.

Small vessels, with local knowledge, can anchor, during a Bora, in Papranica cove, about a mile northward of Luka Žalić.

The north-western end of Otok Silba is bordered by a bank which is as much as 3 cables wide off Rt Samotvorac, the northern extremity of the island (*Lat. $44^\circ 25' N.$, Long. $14^\circ 40' E.$*).

Silbanski kanal is entered from northward between Rt Samotvorac and Otočić Gruica.

Dangers.—Beacon.—Levante bank, with a depth of 5 fathoms (9^m1) over it, lies on the western side of the northern end of Silbanski kanal about $1\frac{1}{2}$ miles south-eastward of Otočić Gruica. To avoid this bank, a vessel should keep either Otočić Lutrošnjak or Otočić Gruica aboard.

Pličina Veli Brak lies in the northern approach to Silbanski kanal about $3\frac{1}{2}$ miles north-eastward of Otočić Gruica. The least depth over Pličina Veli Brak is one fathom (1^m8); this head is marked by an

Charts 1440, 2158a.

o*

Chart 2711.

iron staff, 8 feet (2^m4) high, surmounted by a ball. Depths of less than 10 fathoms (18^m3) extend northward, southward and eastward of this head for a distance of about 3 cables.

- 5 **Telegraph cables.**—A submarine cable, indicated on the chart, is laid across Silbanski kanal from a point situated a short distance south-eastward of Uvala Loza to the vicinity of Luka Žalić. Another submarine cable is laid in the channel from its south-eastern end, midway between Hridi Grebeni and Otok Silba, to the western entrance, 10 midway between Otočić Lutrošnjak and Otočić Gruica.

Lights.—A light is exhibited, at an elevation of 49 feet (14^m9), from a red iron framework structure, 47 feet (14^m3) in height, on Rt Južni Arat.

- A light is exhibited, at an elevation of 28 feet (8^m5), from a grey 15 iron structure on a dwelling, 24 feet (7^m3) in height, on Rt Mavrova.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 15 feet (4^m6) in height, on the shore north-westward of the quay at Uvala Loza.

- A light is exhibited, at an elevation of 16 feet (4^m9), from an iron 20 column, 13 feet (4^m0) in height, on the molehead at Luka Žalić.

- A light is exhibited, at an elevation of 56 feet (17^m1), from an 25 octagonal tower and white dwelling, 43 feet (13^m1) in height, on Otočić Gruica. See view.



Otočić Gruica lighthouse..

- 30 high. It has the appearance, from a short distance seaward, of two round islands sloping gradually towards the sea ; the coasts generally are of little height.

- Otok Olib.**—**Buoy.**—Otok Olib lies eastward of Otok Silba and 35 is separated from it by Olibski kanal. The summit of the island, in the south-eastern part, is 236 feet (71^m9) high and its north-western end is 111 feet (33^m8) high ; the middle is low. The slopes are cultivated and mostly covered with olive trees. The village of Olib, which contained 1,100 inhabitants, in 1931, lies on the western side of the 40 island.

- A bank, with depths of less than 5 fathoms (9^m1) over it, extends about 9 cables south-south-eastward from Rt Ploč, the south-eastern extremity of Otok Olib ; Pličina Grišni Muli, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies near the outer end of this bank, and is marked, on its 45 south-eastern side, by a conical buoy painted in black and red bands and surmounted by two red balls. The summit of Otok Škerda in line with the north-western extremity of Otok Planik, bearing 006° , leads eastward of Pličina Grišni Muli.

- Pličina Zubinin, with a depth of $1\frac{1}{2}$ fathoms (2^m3) over it, extends 50 about 4 cables south-eastward of a point of the same name, situated about a mile westward of Rt Ploč (*Lat. $44^\circ 21' N.$, Long. $14^\circ 49' E.$*).

Sveti Nikola cove, situated on the south-western side of Otok Olib, about $1\frac{1}{2}$ miles north-westward of Zubinin point, affords good shelter to small vessels, with local knowledge, but south-westerly winds cause

Charts 1440, 2158a.

Chart 2711.

a heavy sea; there are bollards ashore to which hawsers can be secured. Sveti Nikola chapel stands at the head of the cove.

Rt Tale, the south-western side of which is bordered by a narrow, shallow bank, lies about $1\frac{1}{2}$ miles north-westward of Sveti Nikola cove. 5
Olibski (Olib) kanal is entered from southward between Arat point, the south-eastern extremity of Otok Silba and Rt Tale.

Telegraph cables.—A submarine cable, indicated on the chart, is laid from Otok Ist to Nozdre cove, half a mile north-westward of Arat point, in Otok Silba. 10

A submarine cable, indicated on the chart, is laid across the southern end of Olibski kanal from Nozdre cove to a cove on the south-western side of Otok Olib, situated half a mile east-south-eastward of Rt Tale. There is a cable house at the head of Nozdre cove and anchorage is prohibited in the cove. 15

Olibski kanal.—**Buoy.**—This channel is about a mile wide in its narrowest part and is often taken by small vessels from Venice bound to Zadar.

Luka Silba lies on the western side of the channel, about $1\frac{1}{2}$ miles north-north-westward of Nozdre cove. In this harbour, there is a 20
small pier protected by a breakwater, the outer end of which is submerged for a distance of 11 yards (10^m1). A red buoy, surmounted by a cylinder, marks the extremity of the submerged portion of this breakwater. Small vessels, with local knowledge, can secure to the pier in depths of about $1\frac{1}{2}$ fathoms (2^m3). Luka Silba is in steamer 25
communication with Sušak, Preko and Šibenik.

On the eastern side of the channel, Luka Olib lies at the head of a bay which is entered between Rt Tale and Abinja point, about 2 miles north-eastward. Here there is a small harbour, protected by a mole, furnished with bollards; small vessels, with local knowledge, 30
can berth alongside the outer portion of the mole, where there is a depth of 10 feet (3^m0). The chapel of Sveti Anastazija in Olib, a short distance south-eastward of the harbour, is conspicuous. Luka Olib is in regular steamer communication with Sušak and Šibenik.

A bank, with a least depth of $6\frac{1}{2}$ fathoms (11^m4) over it, lies from 35
about three-quarters of a mile to $1\frac{1}{2}$ miles westward of Abinja point.

Hrid Kurjak, 13 feet (4^m0) high, lies about three-quarters of a mile north-westward of Abinja point, near the outer edge of a reef which extends about three-quarters of a mile south-westward from the western side of Otok Olib. Luka Olib light is not visible over Hrid 40
Kurjak or this reef.

A shallow spit, on which there is a rock, 16 feet (4^m9) high, extends about 6 cables north-westward from Rt Sip, the north-western extremity of Otok Olib.

On the western side of the channel, between Luka Silba and Rt 45
Samotvorac, the coast of Otok Silba is bordered by a narrow bank, with depths of less than 5 fathoms (9^m1) over it.

Lights.—**Anchorage.**—A light is exhibited, at an elevation of 28 feet (7^m9), from a red iron structure, 23 feet (7^m0) in height, on the head of the breakwater at Luka Silba (*Lat. $44^{\circ} 23' N.$, Long. $14^{\circ} 42' E.$*). 50

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 16 feet (4^m9) in height, on the molehead at Luka Olib.

There is anchorage off Luka Silba, during westerly winds, over a bottom of sand.

Charts 1440, 2158a.

Chart 2711.

Off Luka Olib, the anchorage is exposed to north-westerly winds and, at times, to east-south-easterly winds, but good anchorage can be obtained, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), sand and mud, about 6 cables off the harbour.

Northern approach to Olibski kanal.—**Islet and danger.**—**Light.**—Otočić Morovnik is 16 feet (4^m9) high, and lies about 1½ miles north-westward of Rt Sip. It is bordered by a rocky bank, with depths of less than 4 fathoms (7^m3) over it, which is 3½ cables wide off the north-eastern side of the islet. There is a width of 4 cables between the south-eastern limit of this bank and the extremity of the spit extending north-westward from Rt Sip.

Pličina Morovnik, with a least depth of 2 fathoms (3^m7) over it, rock, lies about 1½ miles north-westward of Otočić Morovnik. The shoalest spot is with the latter islet in line with Hrid Kurjak. The church tower of Premuda village, bearing about 213°, and open north-westward of Otok Silba, leads north-westward; the church tower of Olib village, bearing about 145°, and well open westward of the western side of Otočić Morovnik, leads south-westward; and the south-eastern extremity of Otok Silba, in line with the western side of Otočić Morovnik, bearing 181°, leads eastward of Pličina Morovnik. At night, when near Pličina Morovnik, a vessel should avoid bringing Otočić Gruica light to bear between 247° and 251°.

Between Rt Garmina, the northern extremity of Otok Olib, and a point, about half a mile south-westward, a spit, with a depth of 5 fathoms (9^m1) over its outer end, and steep-to, extends about 6 cables west-north-westward.

A light is exhibited, at an elevation of 27 feet (8^m2), from a red square iron framework tower, 25 feet (7^m6) in height, on the north-western side of Otočić Morovnik (*Lat. 44° 26' N., 14° 44' E.*).

Channel between Otok Olib and Otok Maun.—This channel is about 4½ miles wide in its narrowest part and is entered from south-eastward between Rt Ploč, page 384, and Rt Maun, the southern extremity of Otok Maun (Maon), about 7 miles east-north-eastward. During daylight, in bad weather, Maunski kanal is preferable to this channel.

On the western side of the channel, between Rt Ploč and the north-eastern entrance point of Uvala Slatinica, about 3 miles northward, the eastern side of Otok Olib is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 3 cables wide in places. Uvala Slatinica; the entrance to which is about half a mile wide, is shallow and rocky, and the coastal bank, with a depth of 3½ fathoms (6^m9) over its outer edge, extends 3 cables north-eastward from its south-western entrance point.

Otok Planik, joined to Otočić Planičić, about half a mile off its south-eastern end, by a bank with depths of less than 5 fathoms (9^m1) over it, lies on the south-western side of mid-channel with its south-eastern extremity about 2½ miles north-eastward of Rt Ploč. Otok Planik is 115 feet (35^m0) high; its north-western part is bare, but the remainder is covered with bushes. A shallow bank extends about 1½ cables from the north-western end of this island. Otočić Planičić is 20 feet (6^m1) high and depths of less than 5 fathoms (9^m1) extend about 3 cables from its southern end.

Otočić Poklib, 26 feet (7^m9) high, lies nearly midway between Otok Planik and Otok Maun, north-eastward. The passage on either side of it is clear of dangers.

Charts 1440, 2158a.

Chart 2711.

On the north-eastern side of the channel, Otok Maun is partly covered with bushes and grass ; it ranges in height from 85 to 210 feet (25^m9 to 64^m0). The village of Maun is situated about 1½ miles south-eastward of Rt Sveti Ante, the north-western extremity of the island, and Sveti Ante chapel lies on the south-western side of the island, midway between the point and village. 5

Rt Maun is bordered by a narrow 4-fathom (7^m3) bank ; Otočići Brušnjaci, two in number, lie half a mile and 1½ miles respectively, east-south-eastward of Rt Maun. The western and smaller of these islets is 23 feet (7^m0) high and bare, with a sunken rock close off its south-eastern side ; depths of 4 fathoms (7^m3) extend a short distance northward and westward of this islet and depths of 6 and 7 fathoms (11^m0 and 12^m8) extend half a mile south-eastward of it. The larger islet is 59 feet (18^m0) high, sparsely covered with grass and light in colour ; this islet is bordered by a shallow bank, which extends 4 cables eastward of it. 10 15

The south-western side of Otok Maun, from Rt Sveti Ante for a distance of about 2 miles south-eastward, is bordered by a narrow bank, with depths of less than 5 fathoms (9^m1) over it. 20

On the south-western side of the channel, Hrid Fučin, 13 feet (4^m0) high, lies about 1½ miles south-eastward of Rt Garmina, near the north-western end of a reef which is steep-to on its eastern side ; this reef is joined to the coast of Otok Olib, westward, by a bank about half a mile wide. 25

Otok Škerda, 171 feet (52^m1) high, bare and rocky, lies on the north-eastern side of the channel, about 4½ miles north-eastward of Rt Garmina. A shallow spit, on which there is a sunken rock, extends about 4 cables off the south-eastern end of this island to within 3½ cables of the shore bank extending from the northern end of Otok Maun. 30

Lights.—A light is exhibited, at an elevation of 52 feet (15^m8), from a red column on a red circular hut, with a stone base, 34 feet (10^m4) in height, on the summit of Otočić Poklib.

A light is exhibited, at an elevation of 49 feet (14^m9), from a white circular iron tower, with a stone base, 38 feet (11^m6) in height, situated on the north-western part of Otok Škerda. 35

Anchorage.—Vessels can shelter from a Bora under the south-western side of Otok Maun, in a depth of 7 or 8 fathoms (12^m8 or 14^m6), sand ; the best berth is south-westward of the summit.

Vessels can anchor in a Bora southward of the light-tower on Otok Škerda, in a depth of about 14 fathoms (25^m6), sand, good holding ground ; boulders are available ashore. 40

Telegraph cable.—A submarine cable, indicated on the chart, is laid, in a north-westerly direction, through the channel between Otok Olib and Otok Maun. 45

Chart 2774.

South-western side of Otok Pag.—Luka Poveljanska (Nova Poljana) is entered between Hrastovac point (Lat. 44° 20' N., Long. 15° 05' E.), page 366, and a point about half a mile northward. Both entrance points are bordered by a narrow, shallow bank and the shores of the harbour are bordered by a shallow bank which is about 1½ cables wide in its southern part. The village of Poveljana, which contained 317 inhabitants, in 1931, stands on a hill about 3 cables from the eastern side of the harbour ; south-westward of the village and at the 50

Chart 2774.

head of the harbour stands Sveti Nikola chapel, with a conspicuous group of poplar trees eastward of it. A small breakwater, furnished with bollards, extends from the northern side of the harbour.

- 5 A rock, with a depth of less than 6 feet (1^m8) over it, lies on the narrow coastal bank close northward of the northern entrance point of Luka Poveljanska.

- Luka Košljun is entered between a point, about 1½ miles northward of Hrastovac point, and the south-eastern end of a projection, about 10 1½ miles farther north-westward. The shores of this harbour are fringed by a shallow bank about 1½ cables wide. Bas cove, exposed to westerly winds, lies in the south-eastern part of the harbour. A small mole, with a depth of 8 feet (2^m4) at its head, is situated on the northern side of Luka Košljun, about three-quarters of a mile north-north-eastward of the north-western entrance point.

Rt Zaglava, which is bare and bordered by a narrow, shallow bank, lies about 2 miles westward of the mole in Luka Košljun (*Lat.* 44° 24' N., *Long.* 15° 05' E.).

- Light.—Anchorages.**—A light is exhibited, at an elevation of 20 16 feet (4^m9), from an iron column, 15 feet (4^m6) in height, on the head of the mole in Luka Košljun.

- There is anchorage for large vessels in Luka Poveljanska, within the entrance points, in depths of from 7 to 9 fathoms (12^m8 to 16^m5), mud, good holding ground, and sheltered from the Bora and Scirocco. Small 25 vessels can anchor close off the breakwater. The harbour is exposed to westerly winds; north-westerly winds cause a heavy sea.

- Large vessels can anchor in Luka Košljun, during fine weather; the bottom consists of a thin layer of sand over rock, bad holding ground. During south-westerly, southerly and south-easterly winds, 30 which cause a considerable sea, the anchorage is dangerous. Small craft, with local knowledge, can secure to the mole.

Charts 2711, 2774.

- Maunski kanal.—Beacons.**—This channel is situated between Otočići Brušnjaci, Otok Maun and Otok Škerda, on its south-western 35 side, and Otok Pag, on its north-eastern side. A rapid current sets through the channel and it is frequently visited by violent Bora gales, but it is a good clear channel for steam vessels.

- Maunski (Maon) kanal is entered from south-eastward, between Rt Zaglava and the eastern of Otočići Brušnjaci, about 1½ miles westward. 40 This entrance is contracted to a width of about three-quarters of a mile by the shallow bank extending 4 cables eastward of the latter islet, previously mentioned, and by a spit, with a depth of 3½ fathoms (6^m4) over its extremity, which extends about three-quarters of a mile north-westward of Rt Zaglava. Pličina Sveti Martin (Sumartin), with a 45 least depth of 2 fathoms (3^m7) over it, is situated about 1½ miles north-westward of Rt Zaglava, on the outer end of a bank extending half a mile off the coast of Otok Pag. Sveti Antun (Simeun) chapel, half a mile eastward of the light-structure at Luka Šimuni, bearing 333°, and open westward of Otočić Paladinka, leads westward of the shoals 50 north-westward of Rt Zaglava and about 3 cables eastward of the shoal on the other side of the entrance.

A 7-fathom (12^m8) patch lies in the approach to the channel, about a mile east-south-eastward of the eastern extremity of Otočići Brušnjaci.

Charts 1440, 2158a.

Charts 2711, 2774.

On the north-eastern side of the channel, Otočić Paladinka, 25 feet (7^m6) high, lies about 2½ miles north-westward of Rt Zaglava and a quarter of a mile offshore.

Chart 2711.

Luka Šimuni, the entrance to which is about a cable wide, is situated about 2½ miles north-westward of Otočić Paladinka. A reef, with a depth of 3 feet (0^m9) over it, lies on the shore bank bordering the southern side of Rt Šimuni, the south-eastern entrance point; this bank is about 2½ cables wide. The north-western entrance point is 10 foul for a short distance offshore. This harbour is protected on all sides and affords shelter for small vessels, with local knowledge, over a bottom of rock covered with sand. Sveti Antun chapel, previously mentioned, is conspicuous.

Mandrija (Mandrie) cove, the narrow entrance to which is marked 15 by white stone truncated conical beacons, one on each side, lies about 1½ miles north-westward of Luka Šimuni. In this cove there is a small quay, furnished with bollards, with a depth of about 10 feet (3^m0) alongside, to which small vessels, with local knowledge, can secure.

Rt Mišnjak lies about 1½ miles north-westward of Mandrija cove. 20 Mišnjak islet, 12 feet (3^m7) high, is situated 2 cables north-westward of this point, with a reef between them; a bank, with a depth of 3½ fathoms (6^m4) at its outer end, extends 4 cables north-westward of Mišnjak islet.

Maunski kanal is entered from north-westward between Mišnjak 25 islet and the northern extremity of Otok Škerda, about 2 miles west-south-westward.

For the continuation of the south-western coast of Otok Pag, see page 396.

Light.—A light is exhibited, at an elevation of 20 feet (6^m1), from 30 an iron column, 15 feet (4^m6) in height, on Rt Šimuni (*Lat.* 44° 28' N., *Long.* 14° 57' E.).

WESTERN SIDE OF KVARNERIĆ.—Islands off-lying the southern end of Isola Lussino.—Otočić Gruica, page 382, is 16 feet (4^m9) high and bordered by a shallow bank, extending a cable north- 35 ward. Gruica bank, with a depth of less than 10 fathoms (18^m3) over it, extends about a mile northward of the islet; on this bank, 6 cables from the islet, there is a rocky head, with a depth of 3½ fathoms (6^m9) over it. A rocky shoal, with a depth of 5½ fathoms (10^m5) over it, lies about 1½ miles north-north-westward of Otočić Gruica. 40

The light on Otočić Gruica is described on page 384.

Isola Asinello, 302 feet (92^m0) high, lies with Punta Radovan, its south-eastern extremity, about 2 miles north-north-eastward of Otočić Gruica lighthouse. Punta Radovan is low and whitish, and between it and Punta Ugradizza, 1½ miles westward, the coast is bordered by a 45 bank which, off the latter point, is 2½ cables wide and has depths of only 5 feet (1^m5) over it. The channel between Isola Asinello and Gruica bank is not recommended for a large vessel. A vessel drawing less than 20 feet (6^m1) should keep 3½ cables off the coast of Isola Asinello when using this channel. 50

Chart 1561, plan of Port S. Pietro di Nembi.

Isolotto San Pietro dei Nembi lies parallel with the north-eastern end of Isola Asinello, with Porto San Pietro dei Nembi, page 390,

Charts 1440, 2158a.

Chart 1561, plan of Port S. Pietro di Nembi.

between; this islet is bold, 206 feet (62^m8) high, wooded and has a church near its north-western end. Isolotto Capra lies northward of the north-western end of Isolotto San Pietro dei Nembi, and is separated from it by a narrow channel, with a depth of 4½ fathoms (8^m2) in it, and from Isola Lussino, north-westward, by a channel, about a cable wide, in the fairway of which there are depths of 8 fathoms (14^m6); the current in both these channels is strong and they should be used with caution.

Chart 2711.

Isolotti Oriule, which are rocky, are situated half a mile eastward of the south-eastern end of Isola Lussino and are nearly joined together. Oriule Grande, the northern islet, is 108 feet (32^m9) high, Oriule Piccolo is 36 feet (11^m0) high, and close south-westward of the southern end of the latter lies a rock, 10 feet (3^m0) high; a sunken rock, which breaks, lies 3 cables eastward of the northern part of Isolotto Oriule Piccolo, and Punta Circa, a narrow strip of land, 6 feet (1^m8) high, extends 2 cables off the eastern side of this islet a short distance northward of its southern end. Both islets may be identified from a distance by the light colour of their slopes, on which houses, bushes and cultivation may be seen.

Chart 1561, plan of Port S. Pietro di Nembi.

Porto San Pietro dei Nembi.—Light.—This harbour is the channel between Isolotto San Pietro dei Nembi and Isola Asinello, which is one cable wide in its narrowest part. A shallow bank extends from both sides of the harbour, but in the fairway of the narrow channel between these banks, there is a least depth of 3½ fathoms (5^m9). The channel may be entered by small craft at either end, but the south-eastern passage is the wider and better. Strong currents sometimes set through this channel and, when opposed to the wind, cause a short, high sea.

On the north-eastern shore, about 4 cables from the south-eastern extremity of Isolotto San Pietro dei Nembi, is the Health office, with several bollards north-westward of it and a short mole in shallow water. The village of San Pietro, which contained about 484 inhabitants, in 1940, lies on the south-western side of the harbour, and has a church and two shallow boat basins.

A light is exhibited, at an elevation of 19 feet (5^m8), from a red iron column with a stone base, 16 feet (4^m9) in height, a short distance south-eastward of the Health office, on Isolotto San Pietro dei Nembi (Lat. 44° 28' N., Long. 14° 33' E.).

Anchorage.—The best anchorage in Porto San Pietro dei Nembi, which is only suitable for small vessels, is in a depth of 3½ fathoms (5^m9), westward of the Health office and of a ruined fort close to it; or southward of the Health office, in a depth of 5½ fathoms (10^m1); the bottom is sand, good holding ground; a hawser should be laid out to the shore north-eastward.

In taking the north-western passage, which may be identified by a church near some white cliffs on the northern side, a mid-channel course should be preserved, but the channel is very narrow until past San Pietro village.

Chart 2711.

There is good anchorage between Isolotti Oriule and Isola Lussino, in a depth of 22 fathoms (40^m2), mud and sand, sheltered from the

Charts 2711, 1440, 2158a.

Chart 2711.

Bora and all easterly winds; only the south-south-easterly wind causes a heavy sea. Both the northern and southern entrances are clear of dangers. The best anchorage for small vessels is westward of Oriule Piccolo, off the northernmost houses. 5

This anchorage is recommended as a place of refuge for vessels surprised by bad south-westerly weather in the southern part of Kvarnerić.

Chart 1561, plan of Port S. Pietro di Nembi.

Telegraph cable.—A submarine cable, indicated on the chart, is laid from the north-western end of Isolotto San Pietro dei Nembi 10 to the south-eastern end of Isola Lussino.

Chart 2711.

Canale di Lussino.—General remarks.—Canale di Lussino extends from Isolotti Oriule to the narrows at Ossero, about 13 miles north-north-westward, and is bordered eastward by Secche Palazzuoli 15 and the south-western side of Isola Cherso, and westward by the eastern side of Isola Lussino. The width at the entrance, between Isolotto Oriule Grande and Isolotto Palazzuoli, north-eastward, is about $2\frac{1}{4}$ miles; towards its northern end, the sides of the channel converge until, at Ossero, the channel is only 20 feet (6^m1) wide. The north- 20 western end of the channel is shallow. The bottom, for a distance of 8 or 9 miles northward from the southern entrance, is mud, after which it is sand and shells, with weed at the north-western end.

This channel is too much exposed to south-easterly winds and sea for safe anchorage, but small vessels can anchor at several places, 25 described later.

Since this channel is connected with Il Quarnaro only by Canale di Ossero, which is very narrow off Ossero (*Lat.* 44° 42' N., *Long.* 14° 24' E.), strong irregular currents arise in the northern part in consequence of the considerable differences of level caused by the tides and 30 prevailing winds. The currents are also very noticeable in the south-eastern part of the channel.

Telegraph cables.—Two submarine cables, indicated on the chart, are landed near Lussingrande, one from Scoglio Palazzuoli and the other from the direction of Zadar. 35

Channel.—The eastern coast of Isola Lussino is indented and mostly high. Porto Rovensca, open north-westward, is situated about $2\frac{1}{4}$ miles north-westward of the southern end of Isola Lussino and has space only for small vessels. Northerly and easterly winds cause a heavy sea at the entrance, which is sheltered from north-eastward by 40 a breakwater, but in a strong Bora, the sea breaks over it, and this port is only sought in case of necessity. A vessel entering should give a berth of at least half a cable to the cleft rock that forms the end of the breakwater.

The town of Lussingrande, which contained about 1,508 inhabitants, 45 in 1940, lies between Porto Rovensca and the cove of Lussingrande, about $2\frac{1}{4}$ cables north-westward; the two churches and Leva house in the town are conspicuous. See view facing page 393.

The cove of Lussingrande is narrow and can only accommodate a few small vessels, in depths of from $1\frac{1}{2}$ to $2\frac{1}{2}$ fathoms (2^m7 to 4^m1). 50 It is dangerous to enter in a strong Bora on account of the high sea, in which case Porto Rovensca must be sought.

Valle Darche, situated about a mile west-north-westward of Lussingrande, is sought as a refuge by small vessels, with local knowledge,

Charts 1440, 2158a.

Chart 2711.

in southerly winds. Anchorage is prohibited for a distance of 80 yards (73^m2) off the north-western shore.

Porto San Martino lies about 3 cables northward of Valle Darche ; this port is dangerous in a Bora or easterly winds ; small craft can find shelter in a small basin in the south-western part of the harbour.

Lights.—A light is exhibited, at an elevation of 34 feet (10^m4), from a red iron column with a stone base; 18 feet (5^m5) in height, on the eastern entrance point of the cove of Lussingrande (*Lat.* 44° 31' N., 10 *Long.* 14° 30' E.).

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 16 feet (4^m9) in height, on the molehead at Porto San Martino.

Channel.—Islets and dangers.—Beacons and buoy.—On the north-eastern side of the channel, Secche Palazzuoli, a group of islets, 15 rocks and shallow patches with deep water between them, extend about 6 miles south-eastward from the southern end of Isola Cherso. Excepting a small portion of the bank extending south-eastward from Isolotto Palazzuoli, all these dangers are covered by the *red* sector of the light on Scoglio Palazzuoli between bearings of from 078°, through 20 east, to 150°.

Isolotto Oruda, situated about 4 miles south-eastward of the southern end of Isola Cherso, is 46 feet (14^m0) high ; about 3½ cables farther south-eastward lies Isolotto Palazzuoli, 20 feet (6^m1) high. Isolotto Oruda is bare with a rocky whitish coloured coast and, on the southern 25 part, are some trees and a ruined house ; Isolotto Palazzuoli also has a ruin on it. These islets are connected and surrounded by a bank, with depths of less than 5 fathoms (9^m1) over it, which extends about half a mile south-eastward of Isolotto Palazzuoli and about the same distance northward of Isolotto Oruda ; an above water rock lies 30 on this bank a short distance off the south-eastern end, and a similar rock about 2 cables north-eastward of the northern extremity, of the latter islet, and a rock, with a depth of less than 6 feet (1^m8) over it, lies about 2 cables farther north-westward. A rocky bank, with a least depth of 3½ fathoms (6^m9) over it, lies a short distance eastward 35 of Isolotto Oruda.

Scoglio Palazzuoli, the south-easternmost danger on the bank of that name, with a depth of about 2 feet (0^m6) over it, lies one mile eastward of Isolotto Palazzuoli, with a rocky bank, having depths of less than 5 fathoms (9^m1) over its northern end, midway between 40 them. Scoglio Palazzuoli has a light-tower on its northern side and is covered by the *red* sector of the light on Trstenik islet between bearings of from 346° to 018°.

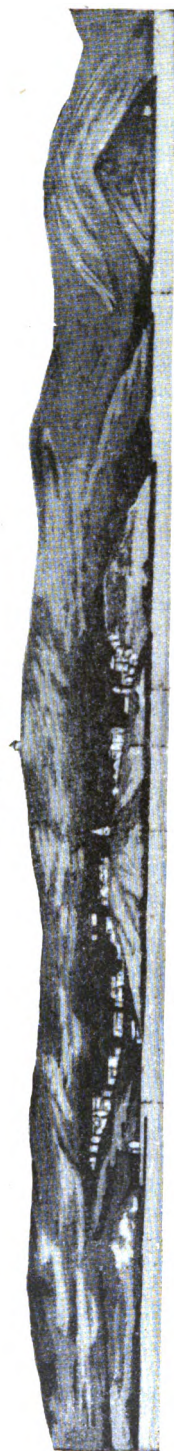
A rocky patch, with a depth of 4 feet (1^m2) over it, lies about a mile north-westward of Isolotto Oruda ; this patch is marked by an iron 45 pole beacon, 20 feet (6^m1) high, painted in red and white bands and surmounted by a ball. A 4-fathom (7^m3) patch lies about 6 cables north-north-westward of the same islet, and a shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 3 cables farther north-north-eastward.

50 Scogli Craglietto, about a mile wide, lies from one to 2 miles north-north-westward of Isolotto Oruda. On this bank there are several heads, the shoalest, with a depth of one foot (0^m3) over it, being situated in the middle ; this head is marked by a red iron pole beacon, surmounted by two balls.

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To face page 393.

*San Giovanni chapel,
in line with Lera House,
bearing about 198°.*



Porto Ronasca.

*Church. Lera House.
Isola Lussino.*

Valle Darche.

Leading mark for the passage between Isola Cherso and Secca Croce.

(Original dated 1910.)

Chart 2711.

Secca Croce, with a depth of 2 fathoms (3^m7) over it, lies about a mile north-westward of the shoalest head of Scogli Craglietto; depths of less than 5 fathoms (9^m1) extend half a mile west-north-westward and east-south-eastward of this shoal which is marked by a red conical buoy, surmounted by two balls. A shoal, about 4 cables long, with a depth of $5\frac{1}{2}$ fathoms (9^m6) over its northern end, lies about 4 cables west-south-westward of Secca Croce. 5

With the exception of a small portion of the shoals extending westward and north-westward of Secca Croce, that shoal and the islets and dangers south-eastward of it are covered by the *red* sector of Trstenik islet light between bearings of from 346° to 018° . These islets and shoals are also covered by the *red* sector of Punta Secca light between bearings of from 285° to 319° , with the exception of the north-western end of the shoal extending west-north-westward of Secca Croce. 10 15

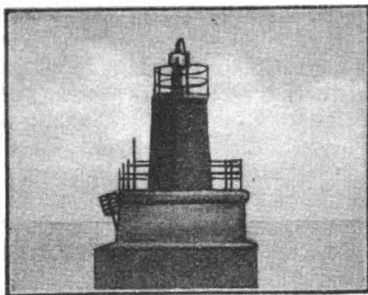
The southern end of Isola Cherso is about $2\frac{1}{2}$ miles across from Punta Secca, the southern extremity of the island, to Punta San Damiano, north-eastward; the land slopes gradually southward; the coast is rugged and deeply indented, forming several inlets, the points being bordered by banks. The slopes are wooded and partly cultivated. Punta Croce, the central point, is low and is situated on the eastern side of Porto Sant' Andrea, the principal inlet. This inlet has sufficient space for a few small vessels, which can anchor off the first group of houses and lay out a hawser ashore, finding shelter in any weather. Porto Baldarin, situated north-eastward of Punta Croce, 25 affords shelter to small vessels, with local knowledge, in its innermost part, in north-easterly and north-westerly winds.

The shore bank, with a depth of $3\frac{1}{2}$ fathoms (6^m9) over its outer end, extends 4 cables south-south-eastward of Punta Secca. The bank extends about $5\frac{1}{2}$ cables southward of the western entrance point 30 of Porto Sant' Andrea, and there is a depth of $2\frac{1}{2}$ fathoms (5^m0) a short distance within its southern edge. A detached shoal, with a depth of 5 fathoms (9^m1) over it, lies about three-quarters of a mile south-eastward of Punta Croce, and near the middle of the channel between Isola Cherso and Secca Croce. A shoal, with a depth of 35 $2\frac{1}{2}$ fathoms (4^m1) over it, lies about $3\frac{1}{2}$ cables southward of Punta San Damiano.

The channel between Isola Cherso and Secca Croce lies in the *white* sector of Trstenik islet light between bearings of from 018° to 032° .

San Giovanni chapel, on Monte Calvario, in line with Leva house, 40 both on Isola Lussino, bearing about 199° , leads through the channel between the shoal extending west-north-westward from Secca Croce and the 5-fathom (9^m1) patch lying south-eastward of Punta Croce. See view facing this page.

Lights.—A light is exhibited, at an elevation of 28 feet (8^m5), from a grey hexagonal tower, surmounted by a red cylindrical column, 31 feet (9^m4) in height, on Scoglio Palazzuoli (*Lat.* $44^\circ 33' N.$, *Long.* $14^\circ 37' E.$).



Scoglio Palazzuoli light-tower.

Charts 1440, 2158a.

Chart 2711.

A light is exhibited, at an elevation of 21 feet (6^m4), from a concrete hut, 18 feet (5^m5) in height, on Punta Secca.

A light is exhibited, at an elevation of 16 feet (4^m9), from a red iron column, 15 feet (4^m6) in height, on the molehead at Porto Sant' Andrea.

Channel. — Light. — On the western side of Canale di Lussino, Isolotto Ossiri grande, 177 feet (54^m0), high and bare, lies about 3½ miles west-south-westward of Punta Secca, and is connected to the coast of Isola Lussino, westward, by a narrow, shallow bank; Isolotto
10 Ossiri Piccolo, 36 feet (11^m0) high, lies about half a mile farther northward and 2 cables offshore.

Porto San Giacomo di Neresine, lies about 3 miles north-north-westward of Isolotto Ossiri Piccolo; this port is exposed to the Bora; the bottom consists of sand and mud.

15 Porto Neresine, a small indentation, lies about a mile northward of Porto San Giacomo di Neresine; this port is exposed to the Bora and Scirocco and all easterly winds. The port is protected by two moles, one extending north-westward and the other south-eastward, leaving an entrance about 44 yards (40^m2) wide; there are quays along the
20 south-eastern side of the port to which small vessels, with local knowledge, can secure. There are depths of about 1½ fathoms (3^m2) in the harbour. A mooring buoy is moored about a cable north-eastward of the southern molehead.

Vessels of moderate size can anchor in the vicinity of the mooring
25 buoy, in depths of from 4½ to 5 fathoms (8^m2 to 9^m1), sand, good holding ground.

The village of Neresine contained about 1,380 inhabitants, in 1940.

A light is exhibited, at an elevation of 16 feet (4^m9), from a red iron column, 13 feet (4^m0), in height, on the southern molehead at Porto
30 Neresine (*Lat.* 44° 40' N., *Long.* 14° 24' E.).

On the north-eastern side of the channel, the south-western coast of Isola Cherso, from Punta Secca to Ossero, about 7 miles north-westward rises in gently wooded slopes.

Porto Martinscizza, about 1½ miles north-westward of Punta Secca,
35 is an anchorage well sheltered from the Bora but is exposed to the Scirocco. A rocky bank, with depths of 4½ fathoms (7^m8) over its extremity, extends about 2 cables southward from Punta Plantur, the western entrance point; at the head of the port, there are two shallow coves divided by a projection from which a reef extends for a short
40 distance. Vessels can anchor in the entrance, in depths of about 11 fathoms (20^m1) and small craft can moor, head and stern, in the north-eastern part.

Porto Caldonte, about a mile north-westward of Porto Martinscizza, is a good place of refuge in all winds; vessels can anchor in the middle
45 of the port with a hawser to the projecting part of the northern side.

Porto Sonte, which is shallow, lies about 3 miles north-westward of Porto Caldonte; it is protected, southward, by a peninsula extending south-westward from the coast of Isola Cherso. Midway between the entrance points of this port, there is a rock, with a depth of 3 feet
50 (0^m9) over it. Small vessels can anchor northward of Porto Sonte under the coast of Isola Cherso. In strong south-westerly winds dangerous whirlwinds descend from Monte Ossero in Isola Lussino.

Eastern side of Isola Cherso.—The eastern side of Isola Cherso forms part of the western side of Kvarnerić, called Quarnerolo by the

Chart 2711.

Italians; from Punta San Damiano, the south-eastern extremity of the island, which is wooded and 69 feet (21^m0) high, the coast trends 10 miles northward to Punta Coromasna; the southern part is indented. This coast is exposed to the Bora, and there is no suitable anchorage for large vessels; for small vessels, only Porto Colorat is recommended; small vessels, with local knowledge, find shelter from a Bora in Valle Coromasna, situated on the south-western side of the point of that name, and from the Scirocco in Valle San Giovanni, about 3½ miles north-north-westward of Punta San Damiano (*Lat.* 44° 38' N., *Long.* 14° 33' E.).

Between Punta Colorat, situated about three-quarters of a mile north-westward of Punta San Damiano, and a point, about a mile farther north-westward, there is a bay in which are several inlets. The shores of this bay are bordered by a bank; a patch, with a depth of 2½ fathoms (5^m0) over it, lies near the edge of this bank, about 4 cables north-westward of Punta Colorat and 2½ cables offshore; and a detached shoal, with a depth of 5½ fathoms (10^m1) over it, lies in the approach to Porto Colorat, a short distance south-eastward of this patch. Secca Colorat, a rocky patch about 3 cables long, lies with its southern end, over which there is a depth of 1½ fathoms (3^m2), about 2 cables north-eastward of Punta Colorat. Secca Trestena, with a depth of one fathom (1^m8) over it, rock, lies about a quarter of a mile north-eastward of the northern entrance point of the bay and 2 cables offshore.

Porto Colorat, the entrance to which is 3 cables wide, lies in the south-eastern part of this bay, close westward of Punta Colorat, and affords the best anchorage, sheltered from all winds; small vessels can anchor, according to draught, under the north-eastern shore, the bottom is sand. Small vessels, with local knowledge, can also find shelter from the Bora in Porto Bocal, the north-western inlet, and from all other winds, in Porto Ul, on the south-western side of the bay.

Off-lying islets and dangers.—**Light.**—Otočić Trstenik (Trestenico), 33 feet (10^m1) high at its northern end, lies about 2½ miles north-eastward of Punta Colorat and is surrounded by a narrow shallow bank.

Isolotto Ciuttin, 33 feet (10^m1) high, and bare, lies about 4½ miles north-westward of Otočić Trstenik and a mile offshore. A bank, with depths of less than 5 fathoms (9^m1) over it and on which there is an above-water rock, extends about 1½ cables from its eastern side. Between this islet and the coast, west-north-westward, there is a rocky shoal, with a depth of 3½ fathoms (6^m4) over it; and another rocky shoal, with a least depth of 2 fathoms (3^m7) over it, lies from about three-quarters of a mile to 1½ miles south-south-eastward of the islet and about a mile offshore.

A light is exhibited, at an elevation of 87 feet (26^m5), from an octagonal stone tower and dwelling, 57 feet (17^m4) in height, on the summit of Otočić Trstenik.

For the continuation of the eastern side of Isola Cherso, see page 406.



Otočić Trstenik lighthouse.

Charts 1440, 2158a.

Chart 2711.

EASTERN SIDE OF KVARNERIĆ.—Otok Pag.—Otok Pag, situated on the eastern side of the southern end of Kvarnerić, is much indented with bays and inlets. The summit, Sveti Vid (Sutvid),
 5 a mountain, 1,142 feet (348^{m1}) high, with a conspicuous chapel on it, is situated near the middle of the island, about 4 miles south-eastward of Rt Mišnjak, page 389.

Otok Pag is one of the four large islands in the Gulf of Quarnaro, but only a small part, sheltered from northerly winds, is cultivated.
 10 It is unprotected by high land north-eastward and its climate is comparatively severe in winter, when it is frequently covered with snow, and northerly winds sweep over it with extreme violence.

The chief products are salt, which is collected from numerous salt-ponds around a lake south-eastward of the town of Pag, (situated on
 15 the eastern side of the island), honey, oil and wine. Sheep and goats are reared in considerable numbers. Only the northern part of the island produces wood of any kind.

From Uvala Slatina, which is entered between Rt Mišnjak and a point about 1½ miles north-eastward, the south-western coast of Otok
 20 Pag, which is much indented, trends 14½ miles north-westward to Rt Lun, the north-western extremity of the island. The north-western part of this coast, for a distance of about 10 miles, is the south-western side of a tongue of land about a mile wide and from 300 to 450 feet (91^{m4} to 137^{m2}) high.

25 Uvala Slatina is open north-westward and there is anchorage in depths of from 6 to 9 fathoms (11^{m0} to 16^{m5}), sand; the holding ground is not reliable and this anchorage is only used in case of necessity; the best berth is north-eastward of Mišnjak islet (*Lat. 44° 30' N., Long. 14° 54' E.*). The head of this bay is shallow and rocky.

30 Luka Novalja is entered between Rt Vrtlić, situated about 3½ miles north-north-westward of Rt Mišnjak, and Gaj point, about a mile farther north-north-westward. Rt Vrtlić is bordered by a narrow, shallow, rocky bank, and depths of less than 5 fathoms (9^{m1}) extend
 4 cables west-south-westward of it. Between Rt Vrtlić and a point,
 35 about a mile south-south-eastward, a bank, with a depth of 6 fathoms (11^{m0}) over its outer edge extends about 1½ miles offshore; a short distance within the outer edge of this bank, there are two patches, the southern one with a depth of 4½ fathoms (8^{m2}), rock, over it,
 40 (9^{m1}) over it. A bank, with a depth of 6 fathoms (11^{m0}) over its north-western end, lies from 1½ to 1¾ miles west-north-westward of Rt Vrtlić. A shallow spit, which is steep-to, extends about 3 cables westward of Gaj point.

Luka Novalja affords good shelter in north-easterly and south-
 45 easterly winds. Vessels of moderate size can anchor in the entrance, under the north-eastern shore, in a depth of 6 or 7 fathoms (11^{m0} or 12^{m8}); small vessels, with local knowledge, can go farther in or berth along the south-western side of the quay off the town of Novalja, situated at the head of the harbour. A short distance north-westward
 50 of the quay, the ruins of a mole, with a depth of 5 feet (1^{m5}) over them, extend about three-quarters of a cable offshore. In the southern part of the harbour, the bottom near the shore is rocky, but elsewhere the holding ground of mud and weed is good.

The larger of the two church towers, bearing 095°, leads in; the two

Charts 1440, 2158a.

Chart 2711.

towers will be nearly in line. At night, a vessel should keep in the centre of the *green* sector of the light on the quay, bearing 097°; the limits of this sector lie rather close to the shoal water off the entrance points.

5

The town of Novalja contained 3,892 inhabitants, in 1931.

Light.—A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 17 feet (5^m2) in height, on the southern corner of the quay at Novalja.

Coast.—**Beacon.**—From Gaj point, the narrow tongue of Otok Pag projects 10 miles north-westward and terminates in Rt Lun, on which there is a ruined chapel and a cable house. The south-western side is indented, and is steep-to at a short distance offshore, until within about three-quarters of a mile southward of Rt Lun. The chapel of Sveti Andjel, 1½ miles south-eastward of the point, and the village of Gurjel, surrounded by trees, about a mile farther south-eastward, are conspicuous.

Zababe cove, situated close northward of Gaj point, Dubac and Potočnica coves, 3½ and 4 miles, respectively, farther north-westward, can be used as anchorages by small vessels, with local knowledge, during a Bora. Dubac cove is also sheltered somewhat from south-easterly and north-westerly winds.

Uvala Tavernele is situated about three-quarters of a mile southward of Rt Lun and affords temporary anchorage for small craft in a Bora. On the south-western side of the cove there is a quay.

25

Between the northern entrance point of Uvala Tavernele and Rt Lun, a bank, with depths of less than 10 fathoms (18^m3) over it and steep-to, extends about a mile north-westward. Tavernele reef, with a depth of 3 feet (0^m9) over it, lies on this bank, about half a mile southward of Rt Lun and 1½ cables offshore, and is marked by a pole beacon surmounted by a white ball; about 1½ cables north-westward of the reef there is a depth of 4 fathoms (7^m3). A shoal, with a depth of 3½ fathoms (6^m4) over it, lies on this bank, about half a mile westward of Rt Lun.

These shoals are covered by the *red* sector of the light on the southern entrance point of Uvala Tavernele between bearings of from 141° to 176°.

The islets lying off the north-western end of Otok Pag are described on page 398.

Light.—A light is exhibited, at an elevation of 29 feet (8^m8), from an iron column, 15 feet (4^m6) in height, on the southern entrance point of Uvala Tavernele (*Lat.* 44° 41' N., *Long.* 14° 44' E.).

Otok Rab.—This island is one of the most important of the islands in the Gulf of Quarnaro, and lies on the eastern side of Kvarnerić, with Rt Kalifront, its western extremity, about 8 miles eastward of Punta Coromasna, page 395. A chain of hills extends north-westward and south-eastward across the island; Mount Kamenjak, 1,338 feet (407^m8) high, bare and red in colour, is situated near the centre of the island, about three-quarters of a mile inland from the north-eastern coast, and is the highest of these hills. The slopes are covered with forest and its valleys are cultivated. The products are wheat, wine, olives, silk and marble; a number of sheep and cattle are reared.

Paški kanal.—This channel is situated between Otok Rab and Otok Dolin, on its north-eastern side, and the tongue of land project-

Charts 1440, 2158a.

Chart 2711.

ing from the north-western end of Otok Pag, with Otočić Dolfin and Laganj, off-lying it, on its south-western side. The channel is entered from north-westward between Rt Kalifront and Otočić Laganj, about 5 4½ miles southward, and leads into Planinski kanal, at its south-eastern end. It is used by vessels bound either to the town of Rab or to that of Karlobag, on the mainland (chart 2774).

On the north-eastern side of the channel, between Rt Kalifront and Rt Frkanj, 5 miles south-eastward, the coast of Otok Rab is indented 10 with several coves where coasters load, and which are sheltered from the Bora. There are one or two shallow patches close offshore, with depths of from 3 to 4 fathoms (5^m5 to 7^m3) over them, which may be avoided by reference to the chart.

Luka Sveta Marga (St. Mara), situated about a mile south-east- 15 ward of the light on Rt Kalifront, is well sheltered from the Bora. The bottom consists of sand and is good holding ground. Uvala Sveti Kristofor, 2 miles farther south-eastward, is well sheltered from the Bora and to some extent from the Scirocco. The bottom is sand and mud, good holding ground. In both these coves there are bollards 20 ashore to which hawsers can be secured.

Chart 1561, plan of Port Rab.

Luka Rab, page 400, is approached between Rt Frkanj and Dolin point, the north-western extremity of Otok Dolin, about three-quarters of a mile south-eastward. Pličina Frkanj, on which there is a light- 25 tower, is situated 2 cables south-eastward of Rt Frkanj; in the passage between the rock and the point, there is a depth of 13 fathoms (23^m8) in mid-channel and 3½ fathoms (6^m4) at a distance of half a cable from the point.

A rocky shoal, with a least depth of 2 fathoms (3^m7) over it, lies 30 between Pličina Frkanj and Dolin point. The passage between Pličina Frkanj and this shoal is 1½ cables wide and that between the shoal and Dolin point is 2½ cables wide.

Chart 2711.

On the south-western side of the channel, Otočić Laganj is 23 feet 35 (7^m0) high and barren; a smaller islet lies close off its southern end, and rocky banks, with depths of from 6 to 10 fathoms (11^m0 to 18^m3) over them, extend about 1½ miles north-westward from its northern extremity.

Otočić Dolfin, 75 feet (22^m9) high and covered with grass in places, 40 lies 2 miles west-south-westward of Rt Lun, page 396, and is almost connected with Otočić Laganj, north-north-westward, by rocky shoals. An above-water rock lies about 2 cables off the northern end of Otočić Dolfin and a rock, 19 feet (5^m8) high, with a sunken rock off it, lies close eastward of the southern end of the islet, where it is bordered by 45 a bank, with depths of from 5½ to 10 fathoms (10^m1 to 18^m3) over it, about half a mile wide.

Otočić Laganj and the banks around and north-westward of it are covered by the *red* sector of the light on Otočić Dolfin, between bearings of from 138° to 153°; but the above-water rock and the north- 50 eastern side of the shoal off the northern end of Otočić Dolfin lie in the *white* sector of that light, bearing more than 153°.

Small vessels can anchor for temporary refuge against a Bora about 2 cables off the south-western side of Otočić Dolfin (Lat. 44° 41' N., Long. 14° 41' E.).

Charts 1440, 2158a.

Chart 2711.

On the north-eastern side of the channel, Otok Dolin lies parallel with the south-western coast of Otok Rab for a distance of about $4\frac{1}{2}$ miles, and is separated from it by Barbatski kanal, page 401. Otok Dolin is 384 feet (117^m0) high at the south-eastern end and 177 feet (53^m9) high at the north-western end; it is thickly covered with bushes, and, except in two or three places, it is steep-to. Školjići, two above water rocks, lie on a shallow bank which extends $1\frac{1}{2}$ cables off Rt Južni (Tužni), the south-eastern extremity of the island.

On the south-western side of the channel, from Rt Lun to the head of Uvala Stara Novalja, about $10\frac{1}{2}$ miles south-eastward, the coast of the projecting tongue of Otok Pag is straight and steep.

Uvala Stara Novalja is entered between the coast just described and Rt Deda, the entrance being about $6\frac{1}{2}$ cables wide. A shallow bank extends about 3 cables from the head of this bay. The Bora and Scirocco blow hard here, but are less squally than in Planinski kanal and do not raise so much sea. The best anchorage in the bay is in the small bight immediately southward of Rt Deda (*Lat.* $44^{\circ} 36' N.$, *Long.* $14^{\circ} 52' E.$), in depths of from 15 to 20 fathoms (27^m4 to 36^m6), sand and mud, good holding ground, with a hawser laid out to the shore; there is also anchorage in the south-eastern part of the bay, but there are no bollards there.

The village of Stara Novalja, which contained 364 inhabitants, in 1931, is situated on the eastern side of the bay about half a mile southward of Rt Deda. The chapel of Sveti Petar (Supetar), near the village, is conspicuous. There is a boat jetty off the village and another at the head of the bay.

From Rt Deda, close off the northern side of which there is a narrow reef, the coast trends eastward $1\frac{1}{2}$ miles to Rt Koromačna. Small craft can find shelter against the Bora in the innermost part of Koromačna cove situated on the western side of the point of that name.

Paški kanal leads into Planinski kanal between Rt Koromačna and the south-eastern end of Otok Dolin.

Lights.—Telegraph cable.—A light is exhibited, at an elevation of 34 feet (10^m4) from a red conical iron tower, 36 feet (11^m0) in height, on the south-western extremity of Rt Kalifront (*Lat.* $44^{\circ} 47' N.$, *Long.* $14^{\circ} 39' E.$).

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 18 feet (5^m5) in height, on the northern entrance point of Uvala Sveti Kristofor.

Chart 1561, plan of Port Rab.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron post on a stone hut, 18 feet (5^m5) in height, on Rt Frkanj.

A light is exhibited, at an elevation of 13 feet (4^m0), from a black iron pyramidal tower, with red bands, on a concrete base, 18 feet (5^m5) in height, on Pličina Frkanj.

Chart 2711.

A light is exhibited, at an elevation of 106 feet (32^m3), from a red conical iron tower, 34 feet (10^m4) in height, on the summit of Otočić Dolfin.

The light on the southern entrance point of Uvala Tavernele is described on page 397.

A submarine cable, indicated on the chart, crosses Paški kanal from Rt Lun to the town of Rab.

Charts 1440, 2158a.

Chart 1561, plan of Port Rab.

Sveta Jefimija cove.—**Anchorage.**—Sveta Jefimija (Eufemija) cove is entered between Rt Frkanj and Rt Sveti Ante, $3\frac{1}{2}$ cables east-north-eastward, and affords well sheltered anchorage in depths of from 5 4 to 15 fathoms (7^m3 to 27^m4), mud. Rt Frkanj is the termination of a tongue of land projecting south-eastward from Otok Rab and forming the south-western side of this cove. A short mole extends south-eastward from Rt Sveti Ante and a shallow, rocky bank extends half a cable from the south-western side of that point. The head of the 10 cove is shallow. The submarine cable from Otok Pag is landed about $1\frac{1}{2}$ cables north-westward of Rt Sveti Ante, where there is a cable house. Sveti Franjo church lies half a mile north-westward of Rt Sveti Ante; Sveta Jefimija convent is situated on the eastern side of the head of the cove, and Bare house stands about $3\frac{1}{2}$ cables south-15 eastward of the convent.

Large vessels can anchor westward of Sveti Franjo church, in a depth of 8 or 9 fathoms (14^m6 or 16^m5); small vessels can secure to bollards south-westward of Bare house. There is a mooring buoy in the cove.

20 **Light.**—A light is exhibited, at an elevation of 15 feet (4^m6), from a red iron column, 10 feet (3^m0) in height, on the head of the mole extending from Rt Sveti Ante (*Lat.* $44^\circ 45' N.$, *Long.* $14^\circ 46' E.$).

Luka Rab.—**Anchorage.**—Luka Rab consists of an outer and inner harbour. Padova cove, the outer harbour, is entered between 25 Rt Sveti Ante and the north-western end of Otočić Školjić, 31 feet (9^m4) high, about $1\frac{1}{2}$ cables south-eastward. The cove is sheltered southward and south-eastward by the latter islet and a breakwater which extends off its north-eastern side towards a breakwater extending a short distance offshore, leaving an opening, 20 feet (6^m1) wide, 30 for boats. The inner and greater part of Padova cove is shallow.

There is anchorage, for a medium-sized vessel, just within the entrance and north-north-westward of Otočić Školjić, in a depth of 9 fathoms (16^m5); it is exposed to south-westerly winds but sheltered from the sea.

35 Deep draught vessels, anchoring off Luka Rab, are recommended to anchor southward of an imaginary line drawn in a 235° direction from Pličina Frkanj light; caution is required to avoid fouling the submarine cable in this vicinity.

The inner harbour is formed on the inner side of Rt Sveti Ante, on 40 which the town of Rab stands, and is sheltered from all winds by a mole extending south-westward from the eastern side, leaving a narrow entrance in which there is a depth of about 3 fathoms (5^m5). The north-western end and north-eastern side of the harbour are shallow, but there are depths of at least 2 fathoms (3^m7) over the remainder. 45 The sides of the harbour are lined with quays, which are furnished with bollards. Small vessels can berth along the south-western side.

Lights.—A light is exhibited, at an elevation of 40 feet (12^m2), from an iron column on a concrete hut, 20 feet (6^m1) in height, on Otočić Školjić.

50 A light is exhibited, at an elevation of 13 feet (4^m0), from an iron column, 14 feet (4^m3) in height, on the head of the mole at the entrance to the inner harbour.

Town.—The town of Rab contained about 1,000 inhabitants, in 1935. The belfry of the cathedral is conspicuous. There are some

Charts 2711, 1440, 2158a.

Chart 1561, plan of Port Rab.

saltworks in the neighbourhood. Fresh provisions are obtainable. Rab is in regular steamer communication with Sušak and other ports in Yugoslavia.

Chart 2711.

Barbatski kanal.—**Anchorage.**—Barbatski (Barbat) kanal, between Otok Dolin and the south-eastern end of Otok Rab has an average width of about 2 cables; the bottom in mid-channel consists of mud in the north-western part and of sand in the south-eastern part; near Dolin it is rocky. On the north-eastern side of the channel, from Padova cove, for a distance of 3 miles south-eastward, the coast of Otok Rab is bordered by a shallow bank; a reef, with a depth of 4 feet (1^m2) over its outer edge, and on which there is an above-water rock, extends about 2 cables from the head of a small bay, situated in front of the village of Barbat, 2½ miles south-eastward of Padova cove.

On the south-western side of the channel, about a mile south-eastward of Dolin point, a bank, with a depth of 2 fathoms (3^m7) over it, extends a short distance offshore; and a bank, with a depth of 5 fathoms (9^m1) over it, extends about 2 cables offshore, at a distance of three-quarters of a mile north-westward of the south-eastern extremity of Otok Dolin (*Lat. 44° 41' N., Long. 14° 51' E.*).

Poklib rock, bare, dark coloured and easily seen, is situated on the north-eastern side of the south-eastern entrance to the channel; this rock is joined to the coast of Otok Rab by a rocky ledge, over which there is a depth of 1½ fathoms (2^m7).

Barbatski kanal affords excellent, well sheltered anchorage for a considerable number of vessels in three places, namely: about 6½ cables within the north-western entrance, off Sveta Lucija cove, situated on the north-eastern side of the widest part of the channel; about 2 miles from the south-eastern end of Otok Dolin; and about a mile north-north-westward of Školjići rocks. It is customary to anchor midway between the two shores and then lay out a hawser to the north-eastern shore.

Two piers extend, in shallow water, from the village of Banjol, situated at the head of Sveta Lucija cove.

South-eastern end of Otok Rab.—**Dangers.**—**Beacon.**—Rt Grič, the south-eastern extremity of Otok Rab, lies about a mile off the coast of the mainland, from which it is separated by Planinski kanal.

Pličina Mišljak (Glavina) lies from 2 to 4 cables southward of Rt Grič and has a general depth of 2½ fathoms (4^m6) over it, with a rock, having a depth of less than 6 feet (1^m8) over it, at its north-western edge; a beacon, consisting of an iron pole, 10 feet (3^m0) high, surmounted by a ball, marks this rock. There is a channel, about 1½ cables wide, between the beacon and the point.

Mišnjak cove, with an islet close off its western entrance point, lies close westward of Rt Grič, and affords shelter to small vessels, with local knowledge, during a Bora. A sunken rock lies close off a small point on Otok Rab, situated between Mišnjak cove and Poklib rock, previously mentioned.

Charts 2774, 2711.

PLANINSKI KANAL (*Continued from page 372*)—**General remarks.**—Planinski kanal extends from Baljenica point (*Lat. 44°*

Charts 1440, 2158a.

Charts 2774, 2711.

15' N., Long. 15° 32' E.), page 371, about 72 miles north-westward as far as Tihi kanal, leading into Golfo di Fiume.

The mainland coast is steep and rocky and is backed by a chain of 5 high mountains, rising about a quarter of a mile inland, which occasions violent Bora squalls, rendering navigation dangerous, especially as this channel scarcely affords any tolerable anchorage.

The coasting vessels which use this channel on their way to Novigrad, Karlobag and Senj, keep close to the coast, so as to be within reach of 10 the various coves and creeks in it, and never remain under way at night during the bad season.

For the course of the channel and the positions of the very few out-lying dangers, reference should be made to the chart.

The south-eastern part of Planinski kanal has been described on 15 pages from 369 to 372.

Chart 2774.

Channel.—Beacon.—The southern part of the mainland coast between Dugi rt (Lat. 44° 21' N., Long. 15° 18' E.), page 369, and Karlobag, about 14½ miles north-westward, is backed within a mile 20 by the Velebit mountains; of which Goli vrh, 4,760 feet (1450^m8) high, stands about 7½ miles north-north-westward of Dugi rt and 3½ miles inland; Pezehi (Pezeni) kuk, 3,494 feet (1065^m0) high, stands about 3½ miles farther west-north-westward; and Budim, 2,503 feet (762^m9) high, stands 2 miles eastward of Karlobag and one mile inland. 25 This part of the coast affords no shelter whatever as far northward as Karlobag, except a few coves suitable only for small coasting boats.

Charts 2774, 2711.

On the south-western side of the channel, between Ljubački tesnac, page 369, and Rt Koromačna, about 22½ miles north-westward, 30 the north-eastern coast of Otok Pag is rocky, steep and barren; strong north-westerly winds are frequent here and, with the exception of Paški zaliv, it affords no shelter whatever.

Chart 2774.

On the north-eastern side of the channel, Sveta Mandalena cove, 35 about a mile north-westward of Dugi rt, may be distinguished by a conspicuous chapel at its head. This cove is not recommended as an anchorage on account of the Bora, which here blows furiously with eddies. Siroka point, on which there are some ruined towers, lies about 1½ miles north-westward of Sveta Mandalena cove.

40 Hrid Konj, which is low and has reefs extending about three-quarters of a cable from its north-western and south-eastern sides and half a cable from its eastern side, lies about 3 miles north-westward of Siroka point and close offshore.

On the south-western side of the channel, Rt Čista lies about 2 miles 45 south-westward of Hrid Konj; Santis shoal, with a depth of 2½ fathoms (5^m0) over it, lies about half a mile south-south-eastward of this point and 1½ cables offshore; Čista cove, close southward of the point, affords shelter to small craft, with local knowledge, from northerly winds. Vessels should anchor off the northern side, where there are rocks 50 ashore to which hawsers can be secured.

On the north-eastern side of the channel, the narrow entrance to Lukovo-Šugarje harbour is situated 2 miles north-westward of Hrid Konj. This harbour affords good anchorage for small vessels in all winds. Vessels can anchor off the health office on the north-eastern

Charts 1440, 2158a.

Chart 2774.

side of the harbour and lay out a hawser to the shore. The village of Lukovo-Šugarje, with a church, lies in a valley south-eastward of the harbour and can be seen by vessels approaching from northward. A reef extends about a quarter of a cable off the north-western entrance point. 5

On the south-western side of the channel, at a distance of about 4 miles north-westward of Rt Čista, a spit, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over its outer end, and steep-to, extends about 3 cables offshore, on the north-western side of Slana cove; Hridi Šestakovci, four in 10 number and bare, lie on a shoal which extends, parallel with the shore, for about 4 cables from close off the outer end of the spit just mentioned.

Rt Sveti Nikola, the north-western extremity of a projection extending from Otok Pag, lies about 4 miles north-westward of Slana cove; Paški zaliv, page 405, is entered between this point and Rt 15 Krištofor, $1\frac{1}{2}$ miles east-south-eastward. Rt Krištofor, on which there is a chapel, is the south-eastern termination of a peninsula connected to the north-eastern side of Otok Pag; a sunken rock lies close off the south-western side of the point. Krištofor shoal, which is rocky and has a depth of $1\frac{1}{2}$ fathoms (3^m2) over it and is steep-to all 20 round, lies about $3\frac{1}{2}$ cables southward of the point. Karlobag church, bearing 352° , and well open eastward of Rt Krištofor, leads eastward of this shoal.

On the north-eastern side of the channel, Bliznica cove is situated about $2\frac{1}{2}$ miles eastward of Rt Krištofor, and is a place of refuge in 25 a Bora; its position may be identified by bringing Sveti Vid, page 396, in line with Rt Krištofor, bearing about 271° . Cernika Velika cove, about $1\frac{1}{2}$ miles north-westward of Bliznica cove, affords shelter in all winds and may be distinguished by some ruins on the southern entrance point (*Lat. $44^\circ 30' N.$, Long. $15^\circ 07' E.$*). 30

Karlobag, situated 3 miles northward of Rt Krištofor, is a small town, which contained 3,320 inhabitants, in 1931; the town is built on a low point on the southern end of which there is a conspicuous church with a steeple. Along the south-western side of the town there is a quay, from the southern end of which, near the church, a mole 35 projects and, farther northward, there are two smaller moles. A sunken rock lies close off the point.

Small craft can berth on both sides of the centre mole, where, except near the root, there is a least depth of 10 feet (3^m0); and also along the south-eastern side of the northern mole, near the outer end of which 40 there is a depth of 23 feet (7^m0). For anchorage, *see* page 405.

The channel between Karlobag and Otok Pag is about a mile wide, but heavy weather at times renders it impracticable for several successive days.

Karlobag is the largest place on the mainland coast of the southern 45 part of Planinski kanal.

Charts 2774, 2711.

On the south-western side of the channel, between Rt Krištofor and Rt Koromačna, page 399, about 11 miles north-westward, the north-eastern coast of Otok Pag is steep and has deep water close-to 50 almost everywhere. A few rocks lie near this coast in places, joined to it by shallow banks. There are numerous coves, but most of them offer little or no shelter in a Bora; small craft can shelter then in Mala Luka cove, situated about $4\frac{1}{2}$ miles north-westward of Rt Krištofor.

Charts 1440, 2158a.

Charts 2774, 2711.

On the north-eastern side of the channel, between Karlobag and the village of Jablanac, about 13 miles north-westward, there are no places of shelter for any but small craft. A reef, on which there is an above-water rock, extends a short distance offshore close south-eastward of Zaliv Drinovica (Drenovića), situated about 3 miles north-westward of Karlobag. Luka Cesarica, about 3 cables farther north-westward, may be used by vessels of medium size, but is not recommended in a Bora. At the head of this cove there is a small quay in front of some houses and a chapel. For anchorage, *see* page 405.

Chart 2711.

Rt Juričnica (Juricinica), lies about $1\frac{1}{2}$ miles north-westward of Luka Cesarica, and Prizna cove, where there is a small boat harbour protected by a breakwater, lies about $1\frac{3}{4}$ miles farther north-westward.

Pličina Prizna, part of which is awash, extends a short distance offshore, close northward of the cove of that name, and is marked by a conical stone beacon, surmounted by a column, painted with red and black bands, 9 feet (2^m7) high.

*Pličina Prizna beacon.*

The harbour of Jablanac, with depths of from 6 to 26 feet (1^m8 to 7^m9) in it, and the southern side of which is quayed, is situated at the head of a small bay and has room only for small vessels. The harbour is protected from all winds. Small craft, with local knowledge, can berth alongside the quay on the south-eastern side. Owing to the proximity of the well sheltered anchorage in Barbatski kanal, page 401, this harbour is seldom used.

The village of Jablanac contained 3,686 inhabitants, in 1931.

Rt Grič, the south-eastern extremity of Otok Rab, with Pličina Mišljak a short distance southward of it, lying on the western side of this part of Planinski kanal, is described on page 401.

Chart 2774.

Lights.—Telegraph cables.—The light on Dugi rt is described on page 372.

A light is exhibited, at an elevation of 36 feet (11^m0), from an iron column, on Hrid Konj (*Lat.* $44^\circ 25' N.$, *Long.* $15^\circ 13' E.$).

A light is exhibited, at an elevation of 25 feet (7^m6), from a red iron column, 16 feet (4^m9) in height, on Rt Sveti Nikola.

A light is exhibited, at an elevation of 203 feet (61^m9), from a red iron framework structure, on a masonry base, 14 feet (4^m3) in height, on Rt Krištofor.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red iron tower, 23 feet (7^m0) in height, on the head of the southern mole at Karlobag.

Chart 2711.

A light is exhibited, at an elevation of 33 feet (10^m1), from a grey octagonal stone tower, 25 feet (7^m6) in height, on Rt Juričnica.

A light is exhibited, at an elevation of 52 feet (15^m8), from an iron structure on a dwelling, 20 feet (6^m1) in height, on Rt Štokić, about 2 cables northward of Jablanac.

A light is exhibited, at an elevation of 21 feet (6^m4) from an iron post on a stone base, 17 feet (5^m2) in height, on Rt Gradić, the northern entrance point of Jablanac harbour.

Charts 1440, 2158a.

Chart 2711.

A light is exhibited, at an elevation of 13 feet (4^m0), from an iron post, 8 feet (2^m4) in height, on the south-western corner of the quay at Jablanac.

Two submarine cables cross this portion of Planinski kanal, one from a short distance northward of Rt Juričnica to Otok Pag, and the other from a short distance northward of Jablanac to Otok Rab.

Anchorage.—There are two anchorages at Karlobag, page 403, one in the road off the town and the other in Baška cove, close eastward of it, in a depth of 9 fathoms (16^m5). Large vessels anchor off the quay, in depths of from 16 to 22 fathoms (29^m3 to 40^m2), mud, dropping an anchor to the south-westward, and laying out a hawser to the shore north-eastward. Vessels of medium size can anchor in the cove eastward of the town (*Lat. 44° 32' N., Long. 15° 04' E.*), and small vessels can also anchor there or secure to the quay. The Bora is severely felt in the road but is much more moderate in the bay to the eastward.

Charts 2774, 2711.

A vessel of medium size, can anchor in the outer part of Luka Cesarica, page 404, in a depth of 10 or 12 fathoms (18^m3 or 21^m9), sand, good holding ground; smaller vessels anchor in the entrance to the narrow part of the cove and lay out hawsers from aft to the shore on both sides.

Paški zaliv.—Paški (Pag) zaliv is a landlocked basin bordered by high land, especially on the south-western side, the entrance to which, mentioned on page 403, is about the middle of the north-eastern coast of Otok Pag. It is open south-eastward, the land on the eastern side, which terminates in Rt Krištofor, overlapping that on the western side for a distance of about 1½ miles and forming an entrance channel about half a mile wide. Three small above-water rocks, which are steep-to, can be seen off the inner point of the north-eastern side of the entrance channel.

The shores of this basin are generally clear of dangers, but in the northern part of the bay, on its south-western side, about 3 miles from Rt Sveti Nikola, the western entrance point, the shore is foul for some distance, with the Karavanic rocks, above water, nearly in mid-channel; the shore eastward of these rocks is also foul, but there is a channel, with a depth of 12 fathoms (21^m9), between. The village of Čaška lies at the head of the north-western arm of this basin, which is known as Uvala Čaška.

Both sides of the south-eastern arm are bordered by a narrow bank. The town of Pag, which contained 4,339 inhabitants, in 1931, is situated at the head of this arm about 2½ miles southward of the entrance, and affords supplies of fresh provisions and water. Fever is prevalent in this neighbourhood in summer.

Chart 2774.

Leading lights.—Two leading lights are exhibited, at elevations of 21 and 22 feet (6^m4 and 6^m7), from iron columns 18 feet (5^m5) in height, situated, the former on the northern mole of the basin at Pag, and the latter about 55 yards (50^m3) south-south-eastward of the former (*Lat. 44° 27' N., Long. 15° 03' E.*). These lights in line, bearing 147°, lead into the inner anchorage through the marked channel.

Charts 2774, 2711.

Anchorage.—The best anchorages in a Bora are the north-western

Charts 1440, 2158a.

Charts 2774, 2711.

part of Barbat cove and Uvala Čaška ; in a Scirocco shelter may be found in Barbat cove, Slana bay, just within the entrance on the north-eastern side, or in the south-eastern arm of Paški zaliv.

5 *Chart 2711.*

Barbat cove is the best anchorage in Paški zaliv and is preferable to all others if making a lengthened stay. On its eastern side are the houses of Metajna and a chapel ; Barbat village, situated about $1\frac{1}{2}$ miles north-westward of the latter, is well visible. There are depths
10 of from 7 to 14 fathoms (12^m8 to 25^m6) charted in the cove ; vessels anchor about 6 cables west-north-westward of the chapel, where the water is deeper.

Chart 2774.

There is anchorage in the centre of the south-eastern arm of Paški
15 zaliv, three-quarters of a mile from the church, in a depth of 12 fathoms (21^m9), mud. Vessels visiting the bay for salt, anchor farther in and secure to the shore. The passage to this inner anchorage has depths of from 11 to $14\frac{1}{2}$ feet (3^m4 to 4^m4) in it, and is marked by groups of posts ; those on the port hand when entering being painted red and
20 those on the starboard hand black. At night the leading lights on the mole at Pag, bearing 147° , lead through this channel.

Charts 2774, 2711.

Directions.—From the northward there is no difficulty in entering Paški zaliv ; Rt Krištofor should be passed at a distance of $1\frac{1}{2}$ or
25 2 cables. In coming from the southward in order to clear Krištofor shoal, keep the western coast close aboard until Rt Krištofor light-house bears more than 003° , then steer in mid-channel.

For the continuation of Planinski kanal, *see* page 411.

Chart 2711.

30 **KVARNERIĆ** (*Western side continued*).—Between Punta Coromasna, page 395, and Punta Tarei, 10 miles northward, the eastern coast of Isola Cherso has few indentations and is mostly steep-to at a short distance offshore. It is exposed to the Bora, which, especially
35 abreast Senjska Vrata, page 408, often sets in suddenly and with very violent squalls. There is no suitable anchorage for large vessels along this coast ; small vessels can find shelter from the Scirocco in Valle Lucovo, about $2\frac{1}{2}$ miles northward of Punta Coromasna.

Punta Tarei (*Lat. $44^\circ 57' N.$, Long. $14^\circ 29' E.$*) is the eastern extremity of a rugged hill, which is joined to Isola Cherso by a low, narrow
40 isthmus, and from a distance appears as a detached rock.

For continuation of eastern side of Isola Cherso, *see* page 421.

Eastern side of Kvarnerić.—**North-western and northern sides of Otok Rab.**—**Beacon.**—Between Rt Kalifront, page 397, and Rt Saramić, about $5\frac{1}{2}$ miles north-eastward, the north-western end
45 of Otok Rab is very much indented. There are three principal inlets, namely:—Uvala Kampor, the westernmost ; Supetarska draga, in the centre ; and Uvala Šipanska (Loparska), the northernmost.

Uvala Kampor, situated north-eastward of Rt Kalifront, is open north-westward. The south-western side is steep-to except at the
50 entrance, where it is bordered by a narrow bank. Otočić Maman, 111 feet (33^m8) high, is situated off the north-eastern entrance point ; a shallow spit extends a short distance off the western end of this islet. The outer part of the north-eastern side of the bay is bordered by a

Charts 1440, 2158a.

Chart 2711.

bank, with a sunken rock on it, and should not be closed. The head of the bay is shallow and a valley runs south-eastward from it. For anchorage, *see* page 408.

Supetarska draga is entered between Otočić Maman and the coast under Mount Sorinj, 430 feet (131^m1) high, about half a mile north-north-eastward; this bay is open north-westward, but is otherwise sheltered from all winds. The coast under Mount Sorinj should be closed when entering this bay, and the south-western side, which is bordered by a bank, should be avoided. A shallow bank extends about 4 cables from the head of the bay. For anchorage, *see* page 408.

Sorinja bank, with a 4-fathom (7^m3) rocky patch on its south-eastern end, is situated from 3 $\frac{1}{4}$ to 7 cables north-westward of Rt Sorinj, the north-western extremity of Otok Rab; there is deep water in the channel between this bank and the point.

Uvala Šipanska, entered between Rt Sorinj and Rt Stojan, the northern extremity of Otok Rab, about 2 $\frac{1}{4}$ miles east-north-eastward, is shallow on its eastern side and at its head. It is open north-westward, and, although the depths are moderate, is not a convenient anchorage, as the Bora blows violently and the Scirocco draws strongly through the valley at its head. Small vessels can anchor off Uvala Makučina, situated on the south-western side of the bay, about half a mile from its head; this cove may be distinguished by a pile of stones on its north-western entrance point. Sveta Marija chapel lies on the eastern side of Uvala Šipanska and, at its head, is the village of Lopar, which had a population of 644, in 1931; there is a small boat harbour here.

Pličina Vela, with a depth of 2 feet (0^m6) over it, lies on the bank extending from the eastern side of Uvala Šipanska, about 6 cables west-south-westward of Rt Stojan (*Lat.* 44° 51' N., *Long.* 14° 44' E.) and 2 cables offshore; this rock is marked on its western side by an iron pole beacon, 9 feet (2^m7) high, surmounted by a sphere. Pregeba rock, with a depth of 2 fathoms (3^m7) over it, lies on the same bank, about 2 cables farther northward.

Rt Stojan projects east-north-eastward and has a cable hut on it. A shallow bank, on which there is a sunken rock, extends a short distance east-north-eastward of this point; the rock is reported to dry at low water.

The coast between Rt Stojan and Rt Saramić, about 1 $\frac{3}{4}$ miles east-south-eastward, forms the southern side of a deep channel, about 3 cables wide, between Otok Rab and Otočić Grgur. This channel is seldom used, but if it should be, Otočić Grgur should be kept aboard.

Rt Šilo is situated about a mile eastward of Rt Stojan; the three coves between these points are shallow and in the westernmost there is a large above-water rock. An above-water rock lies close off Rt Šilo, and westward of it, on the shore bank, there is a rock nearly awash, which breaks.

Between Rt Šilo and Rt Saramić, about three-quarters of a mile south-eastward, there are two shallow coves, of which Saramić cove, the north-western, is encumbered with above-water rocks. Rt Saramić, the eastern extremity of the northern part of Otok Rab, is foul on its south-eastern side, *see* page 412.

Light.—Telegraph cable.—Beacons.—A light is exhibited, at

Chart 2711.

an elevation of 33 feet (10^m1), from an octagonal stone tower, 23 feet (7^m0) in height, on Rt Sorinj.

A submarine cable, indicated on the chart, is laid across the eastern side of Kvarnerić from Rt Stojan to the southern end of Otok Krk. The shore ends of this cable are each marked by a beacon.

Anchorage.—In Uvala Kampor, the best anchorage is in a depth of 10 or 11 fathoms (18^m3 or 20^m1), mud, off the village of Matrda, situated on a hill on the eastern side of the bay. The anchorage is inferior to that in Supetarska draga.

In Supetarska draga, vessels can anchor, in depths of from 12 to 14 fathoms (21^m9 to 25^m6), abreast the Health office on the north-eastern side at a convenient distance for laying out a hawser to the shore.

Otočić Grgur.—**Anchorage.**—Otočić Grgur is situated north-eastward of the northern part of Otok Rab, from which it is separated by the channel previously mentioned. It is barren, only the southern part being sparsely covered with bushes, steep-sided and 760 feet (231^m6) high. In case of emergency, a vessel may anchor, sheltered from easterly winds, in Luka Grgur on the north-western side of the islet, in a depth of about 16 fathoms (29^m3), mud; small vessels find shelter here in a Bora or Scirocco, there being suitable boulders on the north-eastern shore to which hawsers can be made fast.

Otok Prvić.—This island is situated about 1½ miles north-eastward of Otočić Grgur, with Rt Stražica (*Lat. 44° 56' N., Long. 14° 46' E.*), its north-western extremity, about half a mile south-eastward of Rt Skulica (Škuljica), on the south-eastern end of Otok Krk. The island is 1,191 feet (363^m0) high, hilly and barren, there being a single conspicuous tree on its north-western side. Hrid Gnjevica (Gnjevica) is situated on a rocky bank which extends about a quarter of a mile offshore from the middle of the south-western side of the island.

The channel between Otok Prvić and Otočić Grgur is deep and, with the exception of Hrid Gnjevica, free from dangers.

Senjska Vrata.—**Light.**—Senjska Vrata, which separates Otok Prvić from Otok Krk, is used by vessels bound to Senj on the mainland. Mid-channel should be preserved, as shoals extend from the two points of the islands at the narrowest part of this channel. The Bora often blows through this passage with considerable violence.

A light is exhibited, at an elevation of 75 feet (22^m9), from a stone tower on a dwelling, 33 feet (10^m1) in height, on Rt Stražica (*Lat. 44° 56' N., Long. 14° 46' E.*).

For the general description of Otok Krk, see page 420.

South-western side of Otok Krk.—**Lights.**—Between Rt Cernika (Crnika) point, situated 3 miles west-north-westward of Rt Skulica, and Rt Tranjevo, about 3½ miles farther west-north-westward, the coast is barren and steep. A narrow, shallow bank, with depths of less than 5 fathoms (9^m1) over it, borders Rt Cernika and Uvala Baška Stara (Stara Baška), north-westward of it; and a bank, with a depth of 2½ fathoms (5^m0) over it, extends 1½ cables offshore, a short distance southward of Rt Tranjevo.

Otočić Galun is situated about three-quarters of a mile south-westward of Rt Cernika; this islet is bare, whitish coloured, and bordered by a bank. A 4½-fathom (8^m2) patch lies about a quarter of a mile south-eastward of the islet.

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A light is exhibited, at an elevation of 33 feet (10^m1), from a red conical tower on a masonry base, 31 feet (9^m4) in height, on the north-eastern extremity of Otočić Galun.

A light is exhibited, at an elevation of 42 feet (12^m8), from a white house, 10 feet (3^m0) in height, on Rt Tranjevo (*Lat.* 44° 59' N., *Long.* 14° 37' E.).

Northern end of Kvarnerić.—Approaches to Krčki kanal.—Islets and dangers.—Otočić Plavnik and a number of dangers lie at the northern end of Kvarnerić in the southern approaches to Krčki kanal, page 421, between Otok Krk and Isola Cherso. 10

Otočić Plavnik, 636 feet (193^m8) high, lies with Rt Velipin (Krušija) its north-western extremity, about 1½ miles northward of Punta Tarei, page 406, and half a mile off Isola Cherso, separated from that island by Plavnički (Tesni) kanal. It is partly wooded and on the northern and north-eastern sides there are steep reddish brown cliffs. Its coasts are generally bold, except at the south-eastern end, where a shallow bank extends a short distance offshore. 15

Plavnički kanal is deep and clear of dangers, its western side is high, barren and steep-to, except a small portion, about a mile north-north-westward of Punta Tarei, where it is bordered by a narrow bank, with a depth of 4 fathoms (7^m3) over it. This channel connects Kvarnerić with Krčki kanal. 20

The two Otočići Kormati, close together, one of which is 26 feet (7^m9) high, extend from about three-quarters of a mile to 1½ miles south-eastward of Rt Tanki, the south-eastern extremity of Otočić Plavnik; two 4½-fathom (8^m7) patches lie between the north-western islet and Rt Tanki, and a sunken rock lies close off the south-eastern end of the other islet. 25

Otočić Krnjačol, 98 feet (29^m9) high, lies one mile north-north-westward of Rt Tanki and 2 cables off the north-eastern side of Otočić Plavnik. Bičve bank, with a depth of 1½ fathoms (3^m2) over it, lies about three-quarters of a mile northward of the south-eastern end of the south-eastern of Otočići Kormati. Brak Tranjeva shoal, with a depth of 3½ fathoms (5^m9) over it, lies midway between Otočići Kormati and Rt Tranjevo. Krčki But shoal, with a depth of 4 fathoms (7^m3) over it, lies about 1½ miles west-north-westward of Rt Tranjevo. These dangers may be avoided by keeping the coast of Otok Krk aboard. 35

Krčki zaliv is entered between Rt Tranjevo and Rt Željni (Desiderio), about 2½ miles north-westward. The north-eastern and north-western sides of this bay are each bordered by a bank, and a rock, with a depth of 3½ fathoms (6^m4) over it, lies about half a mile east-north-eastward of Rt Željni and 2 cables offshore (chart 1561, plan of Port Krk). Uvala Konobe is situated in the southern part of the eastern side of the bay. The entrance to Košljunski kanal, page 410, lies about 1½ miles northward of Uvala Konobe and Krk luka, page 410, lies about 2 miles farther west-north-westward. For anchorage, see page 410. 45

Krčki kanal is entered from Kvarnerić between Rt Željni and Mali (Veli) Pin point, the northern extremity of Otočić Plavnik, about 2 miles south-westward. 50

Lights.—Signal station.—A light is exhibited, at an elevation of 72 feet (21^m9), from a white circular iron tower on a masonry base,

Chart 2711.

41 feet (12^m5) in height, near Rt Velipin, the north-western extremity of Otočić Plavnik.

The light on Rt Tranjevo is described on page 409.

- 5 A light is exhibited, at an elevation of 27 feet (8^m2), from a red iron structure on a white house, 29 feet (8^m8) in height, on Rt Podstraža, the eastern entrance point of Košljunski kanal.

Chart 1561, plan of Port Krk.

- 10 A light is exhibited, at an elevation of 27 feet (8^m2), from a red square tower with the upper part grey, 26 feet (7^m9) in height, on the breakwater head at Krk luka.

Chart 2711.

- 15 There is a signal station on the western side of Plavnički kanal, about 1½ miles north-north-westward of Punta Tarei and a short distance inland.

- Anchorage.**—Krkčki zaliv affords anchorage for vessels of any size in depths of from 5 to 26 fathoms (9^m1 to 47^m5) mud. Bora squalls reach it from the high valleys of Veli Vrh, about 2½ miles eastward of the bay, and it is advisable to anchor under the eastern shore or off
20 Uvala Konobe, and to take every precaution against this wind. Small vessels can secure in the harbour at Krk, or in the innermost part of Uvala Konobe, and those drawing less than 8 feet (2^m4) also in Aleksandrovo luka.

- Aleksandrovo luka.**—**Lights.**—**Buoyage.**—Aleksandrovo luka
25 is situated, on the eastern side of a basin, about three-quarters of a mile northward of Rt Podstraža, the eastern entrance point of Košljunski kanal. This channel is about 54 yards (49^m9) wide between the shallow banks extending from either side, and has a least depth of 8 feet (2^m5) in the fairway. The harbour is formed by a short
30 breakwater, at its southern end, and a mole, at its northern end, with a small pier between. Small craft can berth along the northern side of the breakwater.

The town of Aleksandrovo, which contained 2,890 inhabitants, in 1931, is situated eastward of the harbour.

- 35 Košljun (Aleksandrovo), an islet with a monastery and a wood on it, is situated in the southern part of the basin.

On the western side of the channel, a short distance within the entrance, are the remains of a concrete column, and on the eastern side of the entrance, there are three stone bollards, close offshore.

- 40 The narrowest part of the channel is marked by two buoys, the south-eastern of which is red, and surmounted by a cylinder, and the north-western, black, and surmounted by a cone; vessels should pass midway between these buoys.

The eastern side of the channel is marked by three iron light-beacons.

- 45 A light is exhibited, at an elevation of 14 feet (4^m3), from an iron column, 11 feet (3^m4) in height, on the head of the breakwater (*Lat.* 45° 01' N., *Long.* 14° 38' E.).

A conical light-buoy is moored about half a cable westward of the head of the breakwater.

- 50 There is a mooring buoy a short distance westward of the light-structure on Rt Podstraža, mentioned above.

Vessels can anchor off the town.

Chart 1561, plan of Port Krk.

Krk luka.—**Light.**—Krk luka, page 409, is a creek protected by

Charts 2711, 1440, 2158a.

Chart 1561, plan of Port Krk.

a breakwater, which projects about a cable east-north-eastward from the southern entrance point. A short mole extends about 50 yards south-south-eastward from the northern side of the harbour, near the cathedral, opposite the head of the breakwater. There are depths of about 13 feet (4^m0) along the western side of this mole, where small craft can berth. Farther westward, on the northern side, there is another mole, projecting a short distance south-westward, and two stone piers. Seas from south-eastward penetrate into the harbour and sometimes break over the breakwater. A flagstaff is situated about three-quarters of a cable south-westward of the inner end of the breakwater.

A light is exhibited, at an elevation of 18 feet (5^m5), from a green iron column, 13 feet (4^m0) in height, on the head of the north-eastern mole.

The light on the breakwater head is described on page 410.

The town of Krk, northward of the harbour, stands high and has a cathedral; it contained 2,484 inhabitants, in 1931. It is the chief place of export for the produce of the island.

Chart 2711.

PLANINSKI KANAL (*continued from page 406*).—Between Jablanac, page 404, and Senj (*Lat. 44° 59' N., Long. 14° 54' E.*), 17 miles northward, the eastern side of Planinski kanal is steep, rocky and with little shelter; there are a few coves where small vessels can anchor. The western side of this portion of the channel is formed by Otok Rab, Otočić Grgur, Otok Prvić and the south-eastern end of Otok Krk, with Otočić Goli, nearly in mid-channel, about a mile south-eastward of Otočić Grgur.

On the eastern side of the channel, Uvala Stinica is situated about a mile northward of Jablanac; in its northern part a vessel of medium size can find shelter in a Bora, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), sand; small craft can moor in the two narrow creeks in the northern and southern corners of the cove. A sawmill lies on the southern side.

On the western side of the channel, Uvala Mag is situated about a mile northward of Rt Grič, page 401, and is open northward. Heavy seas penetrate to the head of this cove during a Bora. Mag rocks, two in number and above-water, the largest of which is 8 feet (2^m4) high, extend about 1½ cables northward of the eastern entrance point and Otočić Lukovac, with a bank extending a short distance from its northern end, lies about half a mile northward of the same point and a quarter of a mile offshore.

Rt Krkljan lies about 2½ miles north-north-westward of the head of Uvala Mag; a reef extends a short distance northward of this point. Pličina Bili Brak, with a depth of 5½ fathoms (10^m1) over it, lies about three-quarters of a mile eastward of Rt Krkljan. The eastern extremity of Otok Rab, bearing more than 163°, kept open eastward of Lukovac, leads eastward of this shoal.

From Rt Krkljan for a distance of about 4½ miles north-westward, the north-eastern side of Otok Rab is steep and of a reddish colour, and is steep-to.

On the eastern side of the channel, Uvala Starigrad (*Lat. 44° 48' N., Long. 14° 53' E.*) is situated about 3½ miles north-eastward of Rt

Chart 2711.

Krkljan. This harbour can be distinguished by a church and a parsonage on the northern side. There is a small mole at the head of the harbour for the local steamer. Small vessels, with local knowledge, can find tolerably well sheltered anchorage here in a Bora or Scirocco.

Uvala Klada, about a mile northward of Starigrad, is not recommended as an anchorage.

On the western side of the channel, Uvala Crnka (Crnika) is entered southward of Stolac point, which lies about $5\frac{1}{2}$ miles west-north-westward of the light-structure at Starigrad. This bay is shallow, with Hrid Lukovac, with some above-water rocks close off it, on its eastern side, and two above-water rocks between it and the head of the bay westward. Small vessels can anchor, in a depth of 4 fathoms (7^m3), mud, good holding ground, about a cable westward of Hrid Lukovac, with a hawser to the shore and are well sheltered from the Bora.

Rt Saramić, page 406, lies about a mile north-north-eastward of Stolac point, the coast between being bordered by a narrow, shallow bank; Hrid Stolac lies on this bank midway between the two points, and there are some above-water rocks on the bank between Hrid Stolac and Rt Saramić. A detached shoal, with a depth of $3\frac{1}{2}$ fathoms (5^m9) over it, lies about $3\frac{1}{2}$ cables southward of Rt Saramić and a quarter of a mile offshore. A reef extends about $1\frac{1}{2}$ cables eastward of Rt Saramić.

Light.—A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 16 feet (4^m9) in height, on the molehead at Starigrad (Lat. $44^\circ 48' N.$, Long. $14^\circ 54' E.$).

Otočić Goli.—This islet lies about $1\frac{1}{2}$ miles eastward of Rt Saramić and about the same distance off the eastern side of Planinski kanal. It is 755 feet (230^m1) high, barren and uninhabited; the coast on the western and southern sides slopes gently but that on the northern and eastern sides slopes steeply. A bank, on which lie the three low, whitish Hrid Mali Goli, extends about half a mile south-south-eastward of Rt Blazna, the southern extremity of the islet; and Veli Brik (Velibrig) reef, part of which uncovers at low water, projects a short distance from Rt Sajalo, the north-western extremity. The best shelter from the Bora is about half a mile southward of Rt Sajalo, off some orchards, in a depth of about 5 fathoms (9^m1), with a hawser to the shore; small vessels can also anchor close to the mainland.

Channel.—**Beacon.**—On the eastern side of Planinski kanal, Malta (Lukovo) point lies 2 miles east-north-eastward of Rt Odglavica, the north-eastern extremity of Otočić Goli. There is a small bay on the eastern side of Malta point, with the town of Lukovo-Otoko on its south-eastern side. A breakwater and a mole extend a short distance off the eastern side of the bay. Vessels may anchor off the town, sheltered from south-easterly and south-westerly winds only; since the Bora can be extremely violent here specially good shore-fasts to the bollards on the eastern shore are necessary. There are depths of only 3 fathoms (5^m5) over the greater part of the bay and the anchorage is about a cable offshore.

Rt Šilo, the south-eastern extremity of Otok Prvić, page 408, lies about $2\frac{1}{2}$ miles north-westward of Malta point.

Dumboka cove lies on the eastern side of the channel, about $2\frac{1}{2}$ miles north-north-eastward of Lukovo-Otoko; it is a tolerably good place

Chart 2711.

of refuge for small craft in a Bora or Scirocco, but is exposed to westerly winds. A ruin, on the southern side, points out the entrance, close off the southern point of which there is a shoal, with a depth of 5 fathoms (9^m1) over it. The head of the cove is shallow for a distance of about 5 half a cable, westward of which the depths gradually increase from about 7 to 12 fathoms (12^m8 to 21^m9); the bottom consists of mud.

Uvala Mlinovi, about half a mile north-north-eastward of Dumboka cove, is well sheltered from southerly winds and is open northward; in a Bora, only the innermost part of the cove affords any shelter. 10 Here there is a small harbour protected by a breakwater extending from each side, with a width of 33 yards (30^m2) between their heads. There are depths of about 4 fathoms (7^m3) in a small area within the breakwaters, where small craft, with local knowledge, can moor. The bottom consists of small stones and mud. 15

The western entrance point of Uvala Mlinovi is bordered by a narrow 5-fathom (9^m1) bank and a shoal, with a depth of 6 feet (1^m8) over it, lies about a quarter of a mile northward of this point. This shoal is marked, on its northern side, by a stone beacon, painted in red and black bands and surmounted by a ball. The passage between the 20 beacon and the point is free from dangers.

Between Uvala Mlinovi and Luka Sveti Juraz, about 1½ miles northward, there is a narrow ravine, crossed by a stone bridge.

Luka Sveti Juraz consists of a small basin with masonry quays, sheltered northward by a mole which extends offshore about 40 yards 25 (36^m6) in a north-westerly direction and then the same distance in a northerly direction; there are two other moles in shallow water outside the basin. An islet, 102 feet (31^m1) high and covered with bushes, lies a short distance off the harbour, but does not shelter it from north-westerly winds. Only small vessels can lie in the basin or 30 secure to the western side of the mole, where there are depths of 13 feet (4^m0). Vessels of moderate size can anchor from one to 2½ cables north-north-westward of the molehead. The town of Sveti Juraz, which contained 4,156 inhabitants, in 1933, lies on the eastern and south-eastern sides of the harbour. 35

Light.—A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column on a white hut, 17 feet (5^m2) in height, on the head of the principal mole at Sveti Juraz (*Lat. 44° 56' N., Long. 14° 55' E.*).

South-eastern side of Otok Krk.—**Light.**—The south-eastern end of Otok Krk is rocky and barren. Zaliv Baška Nova is entered 40 between Rt Skulica, page 408, close off which there are two above-water rocks, and Rt Rebica, about 2½ miles east-north-eastward. This bay lies at the entrance of a deep ravine, through which a stream flows. The land in the vicinity of the bay is cultivated. The bay is completely exposed to south-easterly winds, and is seldom visited 45 except by coasting vessels; its head is shallow for a distance of about 2 cables offshore and the bottom is rocky in places.

The town of Baška Nova, which had a population of 3,543, in 1931, lies on the eastern side of the head of the bay. Off the town, there is a small harbour formed by a mole projecting about 2 cables west-south- 50 westward; north-westward of this mole there are two smaller moles, between which is a mooring bollard in a depth of about 2½ fathoms (4^m1). The bottom on the northern side of the harbour is rocky.

Small craft, with local knowledge, can find shelter along, or off, the

Charts 1440, 2158a.

Chart 2711.

north-western side of the southern mole during all winds ; off this mole there are depths of about $4\frac{1}{2}$ fathoms (8^m2), close alongside it is shallow. Small craft can also secure to the inner side of the north-western mole, which is 82 yards (75^m0) long ; there are depths of 12 feet (3^m7) at the head of this mole, decreasing gradually towards its root.

A light is exhibited, at an elevation of 33 feet (10^m1), from an iron davit on a house, 30 feet (9^m1) in height, on the head of the southern mole (*Lat.* $44^\circ 58' N.$, *Long.* $14^\circ 46' E.$).

- 10 Uvala Velaluka is a narrow inlet entered between a point, about half a mile north-north-eastward of Rt Rebica, and Rt Sokol, the south-eastern extremity of Otok Krk, about 3 cables farther east-north-eastward.

This inlet is exposed to the Scirocco and is not recommended as an anchorage.

- Anchorage.—Telegraph cable.**—Vessels of any size can find anchorage in Zaliv Baška Nova, in depths of from 11 to 16 fathoms (20^m1 to 29^m3), mud, good holding ground, about $2\frac{1}{2}$ cables southward of the mole at Baška Nova. The Bora blows hard, but is steadier than in Planinski kanal ; an easterly wind is rare but is accompanied by a very heavy sea. The Scirocco blows violently out of Senjska Vrata.

- A submarine cable, indicated on the chart, is laid across Planinski kanal from the vicinity of Rt Rebica to Uvala Spasovac on the main-land, about $2\frac{1}{2}$ miles northward of Sveti Juraz ; each shore end is marked by a beacon.

Chart 1561, plan of Port Senj.

- Senj.—Lights.**—The harbour of Senj is situated on the eastern side of Planinski kanal, at the entrance to a deep ravine in the Velebit mountains, about $3\frac{1}{2}$ miles east-north-eastward of Rt Sokol ; the mouth of a stream which flows through the ravine, is situated close southward of the harbour. The harbour is formed by two moles, Marija Art (Sveta Marija) mole, projecting northward from the southern entrance point, and Sveti Ambroža mole, south-westward from the northern entrance point. The entrance, open north-westward, is $1\frac{1}{2}$ cables wide. Sveti Nikole mole projects midway between the other two, from the centre of the town. There is another mole in the north-eastern part of the harbour, also a wooden pier on masonry supports, with a depth of 11 feet (3^m4) at its head, in front of the Bishop's Palace. There are quays between the moles and two mooring buoys in the harbour.

- The harbour is protected from southerly winds by the southern point, but is exposed to north-westerly winds. Every precaution should be taken against the Bora, which is severely felt here ; the holding ground is not good, and anchorage under Otok Krk or in Supetarska draga, page 407, is preferable to exposure to Bora gales at Senj. It often happens that while a heavy Bora is blowing at Senj, a calm or light breeze prevails at a distance of 5 or 6 miles southward or northward.

- Small craft, with local knowledge, can berth at all the moles or quays, but at the quay between Marija Art and Sveti Nikole moles berthing is not recommended.

There are depths of 19 feet (5^m8) at the head of Sveti Nikole mole, about 16 feet (4^m9) along its north-eastern side, and 13 feet (4^m0) along its south-western side ; near the root it is shallow.

Charts 2711, 1440, 2158a.

Chart 1561, plan of Port Senj.

Alongside the mole in the north-eastern part of the harbour, there are depths of from 13 to 10 feet (4^m0 to 3^m0).

Along the south-eastern side of Sveti Ambroža mole, there are depths of from 16 to 10 feet (4^m9 to 3^m0).

A light is exhibited, at an elevation of 28 feet (8^m5), from a tower, 26 feet (7^m9) in height, on the head of Marija Art Mole.

A light is exhibited, at an elevation of 30 feet (9^m1), from an iron post on a dwelling, 26 feet (7^m9) in height, on the head of Sveti Ambroža mole.

A light is exhibited, at an elevation of 15 feet (4^m6), from an iron column, 11 feet (3^m4) in height, on the head of Sveti Nikole mole.

Anchorage.—Directions.—In a Bora, large vessels can anchor outside the harbour of Senj westward of the coast between Marija Art mole and the chapel southward of it, with shore-fasts; there is no shelter here in other winds.

There are no dangers in the approach to Senj harbour, but a vessel should keep at least half a cable seaward of Marija Art mole. At night, a vessel from south-eastward, should sight the *green* light on Sveti Nikole mole, between the *red* and *white* lights on the outer moleheads before entering.

A vessel is recommended not to enter in a strong Bora or Scirocco, without local knowledge.

Town.—Senj, which is built close to the harbour, stands partly on the hilly point which projects westward and is commanded by a ruined castle, which stands at an elevation of 280 feet (85^m3). It had a population of 3,072, in 1931. The town is the see of a Roman Catholic bishop. Building timber and tobacco are exported. Water is laid on to Sveti Nikole mole; provisions are obtainable.

Chart 2711.

Channel.—Buoy.—Current.—On the western side of the channel, between Rt Sokol and the southern entrance to Tihi (Kraljevički) kanal, about 17 miles north-westward, the north-eastern coast of Otok Krk is steep, and is swept by the Bora.

Otočić Zec (*Lat.* 45° 00' N., *Long.* 14° 50' E.), steep-to, bare and 43 feet (13^m1) high, lies in the fairway of the channel, about 1½ miles north-north-eastward of Rt Sokol and a mile offshore.

Uvala Malaluka, situated about 1½ miles north-north-westward of Rt Sokol, trends south-westward and then south-south-eastward. In the inner part, small vessels can obtain complete shelter from the Bora; it is best to secure head and stern, with bow north-eastward. The hawsers should be kept above water because of sharp rocks. This cove is not easily distinguished, but Otočić Zec and two small above-water rocks near the coast, about half a mile north-westward of the entrance will assist in identifying it.

On the eastern side of the channel, between Senj and Luka Novi, 9½ miles north-north-westward, the coast is barren and precipitous, but between Novi and Tihi kanal, the slopes are gradual, mostly covered with trees and in parts cultivated.

Sveta Jelena cove, 1½ miles northward of Senj affords shelter for small vessels from all winds. There are bollards ashore to which hawsers can be secured.

Uvala Žernovica (Žarnovnica), 6 miles north-north-westward of Sveta Jelena cove, and Luka Tepla, a short distance farther north-

Chart 2711.

westward, afford shelter in all winds, but the Bora blows with great force in both places. The bluff promontory dividing these two coves can be identified by its reddish appearance.

- 5 Hrid Sveti Ante, about 11 feet (3^m4) high and bare, lies about half a mile southward of Uvala Žernovica and close to the coast, to which it is connected by a shallow reef.

On the western side of the channel, Rt Glavina lies about 4½ miles west-south-westward of Hrid Sveti Ante. Kamenik rock, low and
10 bare, with some sunken rocks close eastward of it, lies about 1½ cables northward of Rt Glavina.

Luka Sršica, entered between Rt Glavina and Rt Tenki, about a mile westward, is exposed to north-westerly and northerly winds only; it affords good anchorage to small vessels, which anchor with
15 head northward and hawsers to the shore, on the eastern side of the bay, southward of the steps of the tunny fishery. A rock, with a depth of less than 6 feet (1^m8) over it, lies a short distance offshore on the western side of the entrance.

Luka Vrbnik, about 1½ miles west-north-westward of Rt Tenki,
20 is formed by a mole extending northward, leaving a narrow entrance between it and the coast north-westward; there are depths of about 6 fathoms (11^m0) at the head of this mole. Westward of the outer mole, another mole projects a short distance from the south-eastern side of the harbour; there is a depth of about 2½ fathoms (4^m1) at the
25 head of this mole. Small craft can berth along the western side of the outer mole. Seaward of the harbour the depths increase rapidly and the anchorage here, in a depth of 13 fathoms (23^m8), is exposed to the full force of the Bora and the sea. The town of Vrbnik, which contained 2,800 inhabitants, in 1931, is situated on the south-eastern side
30 of the harbour.

Risjeka cove is situated about 1½ miles north-north-westward of Vrbnik. In the northern part of this cove, there is a jetty extending southward, with a depth of 18 feet (5^m5) at its head. There are three mooring bollards westward of the jetty, to which small vessels can
35 secure. The Bora and Scirocco cause a heavy sea in the cove.

Luka Petrina, 2½ miles northward of Vrbnik, affords shelter from the Bora to small craft in its inner part, but the only refuge from this wind for any but vessels of shallow draught is in Stipana bay, page 418.

On the eastern side of the channel, Otočić Petrovac (*Lat.* 45° 07' N.,
40 *Long.* 14° 48' E.), on which there is a conspicuous chapel, lies about 2½ miles north-westward of Hrid Sveti Ante, on a shallow bank which extends a quarter of a mile offshore.

Luka Novi, situated about half a mile north-westward of Otočić Petrovac, is very small and only available for vessels drawing less than
45 16 feet (4^m9). A short breakwater projects from the south-western point of the harbour and, north-eastward of it, there is a stone mole. There is a depth of 4 fathoms (7^m3) in the entrance; a depth of 18 feet (5^m5) between the breakwater and the mole, decreasing to less than 6 feet (1^m8) in places alongside the quay between; and a depth of
50 12 feet (3^m7) along both sides of the outer part of the mole. The northern part of the harbour, between the northern shore and the dam at the mouth of Potok Ričina, has depths of less than 6 feet (1^m8) in it. The harbour is well sheltered and the bottom, of sand and mud, is good holding ground. Small vessels, with local knowledge, can berth along

Chart 2711.

both sides of the mole, on the north-eastern side of the breakwater, alongside the quay, or anchor and secure their stern to the quay. When entering, a vessel should keep midway between the breakwater and the shore northward.

The town of Novi, which contained 2,745 inhabitants, in 1931, stands on high ground at the eastern side of the harbour. The town and a tower, about half a mile eastward of the harbour, are conspicuous.

Jesenova cove, close north-westward of Rt Tokal, a steep, rocky point, situated about 2 miles west-north-westward of Novi, is a well sheltered place of refuge for small craft in a Bora.

Uvala Slana, situated about $1\frac{1}{4}$ miles north-westward of Rt Tokal, is protected by a breakwater projecting from its southern entrance point. At the head of the bay there is a jetty, about 50 yards (47^m7) long, and between this and the breakwater, a small pier, with a depth of 14 feet (4^m3) at its head. Small craft, drawing up to 10 feet (3^m0) can berth along either side of the jetty; on the head of the jetty, there is a one-ton crane. The bay is not available for anchorage on account of mooring wires.

This bay may be identified by a small forest of tall trees on its southern entrance point and by a conspicuous building on its northern entrance point. The latter point is bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, about half a cable wide.

Between the northern entrance point of Uvala Slana and Crikvenica, about $1\frac{1}{4}$ miles north-westward, there is a bight with the harbour of Selce, at its south-eastern end, and that of Crikvenica, at its north-western end.

Luka Selce is sheltered by a breakwater against the sea from southward. A small mole projects south-westward, about 2 cables north-north-eastward of the breakwater, and between the breakwater and the mole there is a small boat basin in the south-eastern part of the harbour. Small vessels can find good shelter, against winds from the eastern semicircle, northward of the breakwater or at the mole in the north-eastern part of the harbour. For anchorage off the harbour, see page 419.

A vessel, approaching from southward, can avoid the bank bordering the northern entrance point of Uvala Slana by bringing the light-structure on the molehead at Selce to bear more than 045° ; at night, the light is not visible bearing less than 045° .

The town of Selce (*Lat. $45^\circ 10' N.$, Long. $14^\circ 43' E.$*), which contained 1,249 inhabitants, in 1931, is situated round the shores of the harbour; the church tower and a building northward of the town are conspicuous.

The coast, for a distance of about 4 cables on either side of Crikvenica, is bordered by a shallow bank; on the south-eastern side of the harbour, this bank is about $1\frac{1}{4}$ cables wide and its outer edge is marked by a black buoy; the bank on the north-western side of the harbour is about a cable wide, the outer edge being marked by two red buoys; vessels entering should pass between the latter and the black buoy.

The harbour of Crikvenica is formed by a breakwater which extends from its southern side, in a south-westerly and westerly direction as far as the edge of the shallow bank, previously mentioned; and by a jetty, which extends offshore parallel with the inner half of the breakwater. The shore between the breakwater and the jetty is quayed.

Chart 2711.

The entrance, open westward, is about 4 cables wide, and there are depths of about 13 feet (4^m0) in the fairway between the heads of the breakwater and the jetty; the depths decrease gradually to 8 feet 5 (2^m4) at a short distance from the head of the harbour. It is well sheltered from all winds. Small craft can berth along the northern side of the outer part of the breakwater; near the root there are sunken rocks. For anchorage, *see* page 419.

The town of Crikvenica contained 5,500 inhabitants, in 1933. There 10 is frequent steamer communication with other ports in the vicinity.

On the south-western side of Planinski kanal, Rt Šilo, the termination of a narrow tongue of land, lies about 1½ miles south-westward of Crikvenica. The point is bordered by a shallow bank and, half a mile south-eastward of it, a shoal with a depth of 2½ fathoms (4^m1) over it, 15 extends a quarter of a mile offshore.

Stipana bay, the entrance to which is about three-quarters of a mile wide, and which is open northward and north-westward, lies westward of Rt Šilo. The village of Šilo, which contained 120 inhabitants, in 1931, is situated at the head of this bay. Here there is a small harbour 20 formed by a mole projecting eastward, with a depth of about 10 feet (3^m0) along its southern side, where small craft, with local knowledge can berth. For anchorage, *see* page 419.

The entrance to Dobrinjski zaton is situated about 1½ miles west-north-westward of Rt Šilo. Greben Salinja, with a depth of less 25 than 6 feet (1^m8) over it, lies near the outer end of a bank which extends about 1½ cables eastward of the northern entrance point, leaving a very narrow channel between it and Rt Glavat on the southern side; in the fairway of this channel, there are depths of 9 fathoms (16^m5). The gulf affords excellent shelter to vessels drawing 30 less than 12 feet (3^m7), which is the general depth in the gulf, although depths of 17 feet (5^m2) exist close southward of Kamičić, and of 15 feet (4^m6), midway between that islet and the southern shore. Crni greben, above-water, lies close off the southern side, about 4 cables west-south-westward of the light-tower of Rt Glavat, and the harbour of Klimno 35 lies about the same distance farther south-westward. Kamičić, an islet, is situated near the middle of the gulf, about a quarter of a mile eastward of some ruins on the western shore; a shoal, with a depth of 6 feet. (1^m8) over it, lies about 2 cables off the eastern side of this islet.

On the north-eastern side of the channel, between Crikvenica and 40 Rt Kačjak, about 2½ miles north-westward, the current generally is north-west-going at the rate of one knot. Rt Kačjak (*Lat.* 45° 12' N., *Long.* 14° 39' E.) is whitish, precipitous, and 115 feet (35^m0) high. For anchorage, *see* page 419.

Havišće (Havlišće) bay is situated about 1½ miles north-westward 45 of Rt Kačjak and close eastward of Rt Ertak. For anchorage, *see* page 419.

Tihi kanal, page 419, is entered from southward between Rt Ertak and Rt Turnac, about 4 cables north-westward.

Lights.—A light is exhibited, at an elevation of 16 feet (4^m9), from 50 an iron column, 15 feet (4^m6) in height, on the head of the outer mole at Vrbnik.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red iron tower, 23 feet (7^m0) in height, on the head of the southern breakwater at Novi.

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Chart 2711.

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron column, 11 feet (3^m4) in height, on the inner molehead at Novi.

A light is exhibited, at an elevation of 65 feet (19^m8), from a grey octagonal masonry tower, 23 feet (7^m0) in height, on Rt Tokal.

A light is exhibited, at an elevation of 14 feet (4^m3), from an iron column with a stone base, 13 feet (4^m0) in height, on the head of the mole in the north-eastern part of Luka Selce.

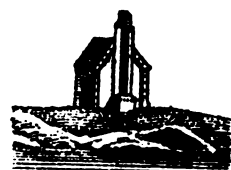
A light is exhibited, at an elevation of 20 feet (6^m1), from an iron structure on a hut, 15 feet (4^m6) in height, on the head of the southern breakwater at Crikvenica.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column, 15 feet (4^m6) in height, on the molehead at Silo harbour.

A light is exhibited, at an elevation of 29 feet (8^m8), from an octagonal tower, 21 feet (6^m4) in height, on Rt Glavat, the southern entrance point of Dobrinjski zaton.

A light is exhibited, at an elevation of 29 feet (8^m8), from an iron column and dwelling, 20 feet (6^m1) in height, on Rt Ertak.

A light is exhibited, at an elevation of 29 feet (8^m8), from a white octagonal tower, 21 feet (6^m4) in height, on Rt Turnac.



Rt Ertak lighthouse.

Anchorage.—Off Selce, vessels of moderate size can anchor westward of the molehead, in a depth of 6½ fathoms (11^m9); the Bora blows hard here, but the holding ground of sand is very good.

Off Crikvenica, deep-draught vessels can anchor, either with the breakwater light-structure bearing 078°, distant 6½ cables, in a depth of 24 fathoms (43^m9), mud, or off the mole at Dražica, three-quarters of a mile north-westward of Crikvenica. Smaller vessels can anchor with the breakwater light-structure bearing 050°, distant 2½ cables. Although the anchorage ground outside the harbour is good, it is much exposed to the Bora and Scirocco.

In Stipana bay, vessels desiring to anchor should do so, in depths of from 15 to 17 fathoms (27^m4 to 31^m1), mud, near the eastern side of the bay, with a hawser to the shore north-eastward.

Large vessels can anchor in a Bora westward of Rt Kačjak in a depth of 18 fathoms (32^m9); small vessels moor in the cove on the northern side of the point.

Havišće bay affords some shelter in a Bora to small vessels, which anchor in the middle of the bay in a depth of 8 fathoms (14^m6).

TIHI KANAL.—Tihi (Kraljevički) kanal is situated between the mainland, on its north-eastern side, and the northern end of Otok Krk, on its south-western side, and extends from Rt Ertak (*Lat.* 45° 13' N., *Long.* 14° 37' E.) about 3½ miles north-westward to the northern end of Otok Sveti Marko, and connects the northern end of Planinski kanal with Golfo di Fiume. Bora gales blow here with great fury; the Scirocco is also strong and with it the current may attain a rate of 3 knots. The channel is deep, and between Otok Sveti Marko and the mainland is very narrow and winding; the only shelter is in some coves in the mainland coast.

Small vessels can find shelter against the Bora and Scirocco in Sveti

Chart 2711.

Jakov (Perčin) cove, situated on the eastern side of the channel, about half a mile northward of Rt Ertak. Here there is a quay, with a depth of 10 feet (3^m0) alongside, and bollards ashore to which hawsers can be secured. This is the best anchorage in Tihi kanal and is a port of call for the local steamers.

On the south-western side of the channel, the bays on either side of the rocky peninsula of which Rt Turnac, page 418, is the south-eastern termination, are not suitable as anchorages; the southern bay is exposed to the full force of the Bora and Scirocco and the northern bay has an untrustworthy bottom. The village and church of Voz stand on the peninsula. Rt Voščica lies on the north-eastern side of this peninsula, about a mile north-westward of Rt Turnac.

Rt Dubno lies on the north-eastern side of the channel, about a mile north-westward of Rt Voščica; Dubno cove, close north-eastward of the point, affords shelter from both the Bora and Scirocco.

Otok Sveti Marko is barren, rocky and of whitish aspect; it is 342 feet (104^m2) high and is situated close to the northern extremity of Otok Krk; it rises steeply at the south-eastern side but becomes level north-westward and is steep-to except the northern part, which is bordered by a narrow bank. This islet is a good mark for the whole of Golfo di Fiume. It divides the northern entrance to Tihi kanal into two passages; the south-western passage, between Otok Sveti Marko and Otok Krk, into which a bank extends 1½ cables from the northern extremity of Otok Krk, is unsuitable for all except the smallest vessels under favourable circumstances; the north-eastern passage, between Otok Sveti Marko and the mainland, is about a quarter of a mile wide and has no sunken dangers.

Lights.—The lights on Rt Ertak and Rt Turnac are described on page 419.

A light is exhibited, at an elevation of 39 feet (11^m0), from an octagonal masonry tower, 34 feet (10^m4) in height, on Rt Voščica.

A light is exhibited, at an elevation of 79 feet (24^m1), from an iron structure on a dwelling, 20 feet (6^m1) in height, on Rt Dubno (*Lat.* 45° 15' N., *Long.* 14° 34' E.).

A light is exhibited, at an elevation of 49 feet (14^m0), from a red conical iron tower with a masonry base, 25 feet (7^m6) in height, on the north-eastern extremity of Otok Sveti Marko.

OTOK KRK.—**General description.**—Otok Krk is the northernmost and largest of the islands in the Gulf of Quarnaro, and of all the islands in the Adriatic it is second only to Brač in population and is superior to Vis in the variety and abundance of its produce.

Of the various mountains, Obzova (Obrova), 1,867 feet (569^m1) high, Orljak, 1,768 feet (538^m9) high, and Veli Vrh, 1,775 feet (541^m0) high, all in the south-eastern end of the island, with Mount Sveti Juraj, 1,076 feet (328^m0) high (*Lat.* 45° 07' N., *Long.* 14° 36' E.), near the north-eastern coast, are the most remarkable. The eastern coast is steep; on the north-western side, the slopes fall more gently to the sea.

The south-western part is lower and more fertile than the opposite side, but a great part is covered with woods. This island is noted for a peculiar breed of active horses. The gentle slopes of the higher

Charts 1440, 2158a.

Chart 2711.

parts afford excellent pasturage, good wine, olives and various fruits are produced. The island is nearly everywhere surrounded by deep water, with several bays; for large vessels there are some partly sheltered anchorages, but no good harbour.

For the description of the southern part of the south-western side of Otok Krk, *see* page 408; for that of the south-eastern side, *see* page 413; and for that of the north-eastern side, *see* pages from 415 to 420.

KRČKI KANAL.—Krčki (Krk) kanal, the southern entrance to which is described on page 409, is situated between Otok Krk, on its north-eastern side, and the northern part of Isola Cherso, on its south-western side. It connects Kvarnerić with Golfo di Fiume. The islets and dangers in the south-eastern approach are described on page 409.

On the south-western side of the channel, between Punta Cosmini (Kosmin), at the north-western end of Plavnički kanal, page 409, and Punta Grotta, about 10 miles north-north-westward, the eastern coast of Isola Cherso is high, barren, steep, cliffy in parts and steep-to. It is exposed to the Bora and there is no anchorage along the whole extent and a near approach to it is to be avoided. The chart is sufficient guide as there are no outlying dangers.

The chapel of San Bartolomeo, on a hill, 1,030 feet (313^m9) high, about 1½ miles westward of Punta Cosmini, and the chapel at Caisole, 8½ miles farther north-north-westward, are conspicuous. A short mole projects from the coast about 3 cables south-south-eastward of the latter chapel.

On the north-eastern side of the channel, between Rt Željni (*Lat.* 45° 01' N., *Long.* 14° 34' E.), page 409, and Rt Glavotok, about 7 miles north-westward, the south-western coast of Otok Krk contains several coves and bays which afford shelter to small craft in a Bora. The chart is a sufficient guide.

The convent of Sveta Marija, surrounded by cypress trees, stands close southward of Rt Glavotok, and Rt Spena lies about 1½ miles southward of the same point.

Lights.—The light on the north-western extremity of Otočić Plavnik is described on page 410.

A light is exhibited, at an elevation of 39 feet (11^m9) from a white conical iron tower, on a masonry base, 32 feet (9^m8) in height, on Rt Spena.

A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron column, 18 feet (5^m5) in height, on the molehead at Caisole (*Lat.* 45° 06' N., *Long.* 14° 21' E.).

IL QUARNARO.—**General remarks.**—Il Quarnaro is formed by the eastern coast of Istria, on its western side, and Isole Cherso, Lussino, Unie and Sansego, on its eastern side; it communicates at its northern end, through Canale della Faresina, with Golfo di Fiume.

The Bora is often very violent and dangerous in Il Quarnaro and vessels are obliged to bear up for shelter under Capo Promontore, the southern extremity of Istria, or for one of the harbours in the neighbourhood; or, if necessary, to anchor at once wherever they may be. This wind undergoes remarkable shifts; northward, it usually follows the direction of the channel; towards the middle, it veers eastward; and it generally becomes northerly again as the coast of Isola Cherso is

Charts 200, 1440, 2158a.

Chart 2711.

approached. South-westerly winds are mostly of short duration, but always cause a very high sea; in the northern part of the channel their direction becomes southerly. See also Local winds, Eastern shore of Adriatic, page 15.

Fogs are very rare.

The current is rapid in the narrowest part, in northerly winds, when it sometimes attains a rate of 4 knots. The flood tidal stream is north-going along the coast of Isola Cherso and south-going along the coast of Istria; the ebb tidal stream is south-going throughout the channel. In fine weather the tidal streams are regular; at other times, the degree of irregularity, caused in a great measure by the channels among the islands, depends on the force and direction of the wind.

The features most easily identified, on approaching from southward, are Monte Ossero (*Lat. 44° 40' N., Long. 14° 22' E.*), 1,929 feet (588^m) high, near the northern end of Isola Lussino; Monte Maggiore, 4,580 feet (1396^m) high, about 8½ miles north-westward of the northern extremity of Isola Cherso; Capo Promontore; and Scoglio Poror, 1½ miles west-south-westward of that cape. Monte Ossero has a naked, conical, white top. Monte Maggiore, which rises above the surrounding mountains and is visible a great distance, has a conical, forked summit, on which is a stone watch tower. Capo Promontore consists of a number of low hillocks, mostly covered with bushes, which, in clear weather, are first seen on the horizon. The summits of both Monte Ossero and Monte Maggiore are clouded shortly before and during sea winds, especially south-easters, and become clear again suddenly at the cessation of them. See views facing this page.

Western side of Il Quarnaro.—Aspect.—Baia di Medolino, entered between Capo Promontore and Capo Merlera, about 4 miles north-eastward, is described on page 451. Between Capo Merlera and Punta del Gatto, the northern entrance point of Valle Fianona, about 21 miles north-north-eastward, the eastern coast of Istria is generally rocky, precipitous, and of forbidding aspect. It is backed by extensive forests which present a wild and desolate appearance. The high lands of Istria, which are ramifications of the Julian Alps, are mostly on this side of the peninsula. There are no dangers at a distance of more than half a mile offshore; among its indentations are a few narrow bays and inlets, but none suitable for large vessels, with the exception of Porto Gradaz, page 426. The Bora is severely felt and scarcely a blade of grass grows on places fully exposed to it.

Light.—A light is exhibited, at an elevation of 69 feet (21^m) in height, from a white square stone tower and dwelling, 31 feet (9^m4) in height, on Capo Merlera (*Lat. 44° 48' N., Long. 14° 00' E.*).

Coast.—Beacon.—Capo Merlera, situated at the western side of the entrance to Il Quarnaro, is 69 feet (21^m) high, bare and steep-to.

Porto Cuie (Cuje), a small inlet, is entered between Punta Uliva, about a mile north-north-westward of Capo Merlera, and Punta Patera, about half a mile farther northward.

Scoglio Laccosase, just above water, lies 3 cables south-eastward of Punta Uliva, near the outer end of a shoal, which extends from half



Capo Merlera lighthouse.

Charts 200, 1440, 2158a.



Isola Sansego.

*Monte Grosso
Isola Unie.*

Canidole Grande.

Canidole Piccolo. Monte Maggiore.

Chiunshi.



*Monte Osiero, bearing
(NN)° 15 miles.*

*Monte Asino.
Entrance to Golfo di Lassimpiccolo.*

Bocca Falsa.

*View in 2 parts of entrance to Il Quarnaro.
(Original dated 1893.)*



Punta Nera. Monte Maggiore.

Monte Halm.

Schneberg.

Monte Chelm.



Punta Presteniaz.

*Soglio Galiola
lighthouse.*

Punta Pernala.

*View in 2 parts of entrance to Il Quarnaro; taken from a position 5 miles 270°
from Punta Unietta, Isola Unie.
(Original dated 1893.)*

Chart 2711.

a cable to $2\frac{1}{2}$ cables offshore; this rock is marked by an iron pole beacon, surmounted by a sphere, painted in black and white stripes. A vessel must pass eastward of the beacon. This beacon is liable to be washed away.

A short distance within the entrance, the sides of Porto Cuie are bordered by a narrow bank, with depths of less than 2 fathoms (3^m7) over it, and the head of the inlet is shallow. The inlet is sheltered from all winds, but is suitable only for small vessels. The best anchorage is in the south-eastern part, in a depth of about $3\frac{1}{2}$ fathoms (6^m4), 10 sand, good holding ground. The white quarry, with a road, southward of the inlet serves as a mark.

Between Punta Patera and Punta Zuffo, about $3\frac{1}{2}$ miles northward, the coast is high, steep, and wooded.

Chart 2711, plan of Port Bado.

Porto di Bado is entered between Punta Zuffo and Punta Forticcio, about three-quarters of a mile north-eastward. Punta Zuffo is whitish, rocky and 174 feet (53^m0) high. Scoglio Forticcio, above water, lies on the end of a shallow, rocky spit which extends about $1\frac{1}{2}$ cables southward from Punta Forticcio. Valle Cavan, on the western side of 20 Punta Forticcio, is not suitable for an anchorage.

Porto di Bado extends westward and then north-westward; the sides are high and covered with shrubs. Valle di Bado Piccolo lies on the south-western side near the head of the inlet, and Valle di Bado Grande, at its head; both these small bays are shallow, and, on the 25 coast between them there is a house with a red roof. The Health office, off which there is a small mole, is situated on the eastern side of Valle di Bado Grande.

There is anchorage, in a depth of 10 or 11 fathoms (18^m3 or 20^m1), red mud, good holding ground, about $2\frac{1}{2}$ cables south-eastward of the 30 house with a red roof; small craft can anchor nearer the Health office and lay out a hawser north-eastward. This anchorage is sheltered from the Scirocco, the sea from which is only felt strongly in the outer part of the inlet.

A vessel, entering Porto di Bado, should close Punta Zuffo to avoid 35 Scoglio Forticcio (Lat. $44^\circ 54' N.$, Long. $14^\circ 01' E.$).

Chart 2711.

Valle Vignole, entered between Punta Lunga, about $1\frac{1}{2}$ miles north-north-eastward of Punta Forticcio, and Punta Cavallo, about 4 cables farther north-eastward, affords anchorage for small vessels, in depths 40 of from $3\frac{1}{2}$ to 8 fathoms (5^m9 to 14^m6), sand, good holding ground, in two coves, one on each side of the bay, but it is exposed southward and eastward. A rock, with a depth of one foot (0^m3) over it, lies nearly midway between the entrance points.

Porto Carnizza is entered between Punta Socciola, about $1\frac{1}{2}$ miles 45 north-north-eastward of Punta Cavallo, and Punta Grossa, about half a mile farther northward. The sides of this inlet are high. The depths gradually decrease towards the head, which is shallow. The inlet is narrow but affords shelter to small vessels from all except south-easterly winds. Vessels can moor in the inner part, in depths of from 50 $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms (6^m4 to 10^m1), hard mud, and lay out a hawser north-eastward. There is a Health office at the head of the inlet and the village of Carnizza is situated about $1\frac{1}{2}$ miles north-westward of it, at an elevation of 702 feet (214^m0).

Charts 1440, 2158a.

Chart 2711.

Canale d'Arsa, page 425, is entered between Punta Grossa and Punta Ubas, about half a mile eastward.

Val Mazzinghi, open southward, lies westward of Punta Artasi, which is situated about $2\frac{1}{2}$ miles north-eastward of Punta Ubas. This bay affords shelter to large vessels against the Bora. The best anchorage is with Punta Artasi in line with Punta Nera, bearing about 110° , in a depth of 25 or 26 fathoms (45^m7 or 47^m5), yellow mud, good holding ground. It is not advisable to anchor nearer the land as the bottom is rocky.

Valle Voschizza, entered between Punta Artasi and Punta Nera, about a mile east-south-eastward, is not recommended as an anchorage.

Punta Nera is high, dark coloured, thickly wooded, steep-to and visible from a considerable distance, as is Monte Calvo, 1,765 (538^m0) high, about 4 miles northward, of which it is a spur.

Lights.—A light is exhibited, at an elevation of 46 feet (14^m0), from an iron tower, 18 feet (5^m5) in height, on Punta Ubas (*Lat.* $44^\circ 57' N.$, *Long.* $14^\circ 04' E.$).



Punta Nera lighthouse.

A light is exhibited, at an elevation of 49 feet (14^m9), from a lantern on the corner of a white stone dwelling, 24 feet (7^m3) in height, on Punta Nera.

Distress signals are made from this lighthouse, *see* page 44.

Coast.—Porto Longo is entered between Punta Santa Marina, on which there is a chapel, about $4\frac{1}{2}$ miles northward of Punta Nera, and Punta Longa, about half a mile farther northward. This inlet is too narrow to be entered except by small vessels. It is open south-eastward; southerly and south-easterly winds cause a heavy sea, and it is necessary to secure to the shore against the violent Bora squalls. Vessels can moor westward of the houses on the north-eastern side, about half a mile within Punta Longa, where there are depths of about 19 fathoms (34^m7), good holding ground, with a hawser to the shore south-westward.

Landing is prohibited in Porto Longo except in case of necessity. *Chart 2711, plan of Porto Albona.*

Punta San Giorgio, with a church on it, lies about a mile north-north-westward of Punta Longa; a shoal, having a rock, with depths of less than 6 feet (1^m8) over it, near its outer edge, extends about a cable north-eastward of this point.

Punta Sant' Andrea lies about three-quarters of a mile north-north-eastward of Punta San Giorgio; a shallow bank extends about half a cable off this point.

Porto Albona is situated westward of Punta Sant' Andrea; this port affords shelter from westerly and north-westerly winds, and the holding ground is good. The head of the port is shallow, owing to silt from Torrente Rabaz, which flows into it. Southerly and south-easterly winds are severely felt and the Bora reaches the port in violent gusts. The village of Rabaz stands inland, a short distance from a bight on the north-eastern side, situated about half a mile north-westward of Punta Sant' Andrea; here there is a masonry wharf. In

Charts 1440, 2158a.

Chart 2711, plan of Porto Albona.

1940, works, marked by buoys, were under construction southward of this wharf. There is a wharf on the western side of the port.

Vessels of medium size can anchor in the middle of the bay, and small vessels near the north-eastern shore; there are bollards on the eastern side. Two mooring buoys lie in the bay, one for vessels of medium size, in a depth of 12 fathoms (21^m9), and the other for small vessels, in a depth of 6 fathoms (11^m0), off the wharf at Rabaz.

This anchorage serves as a port to the ancient town of Albona, which stands on a hill, about 1½ miles westward. 10

Chart 2711.

Valle Fianona, about 3 miles northward of Porto Albona, lies on the western side of the southern entrance to Canale della Faresina; the bottom of this inlet consists of mud. The small town of Fianona, which contained about 381 inhabitants, in 1940, stands on a hill a short distance northward of the head of the inlet. 15

From seaward Valle Fianona appears like a dark cutting in the mountains; it may be identified by the bare, steep Punta del Gatto, the north-eastern entrance point (*Lat.* 45° 07' N., *Long.* 14° 12' E.).

At the head of the inlet, a channel, with depths of from 11 to 15 feet (3^m4 to 4^m6) in it, marked with dolphins and piles leads to a masonry quay. Valle Fianona is open south-eastward and is visited by Bora gales of extraordinary violence, which are thrown back from the steep lee coast in south-westerly squalls; the Scirocco sometimes sends in a heavy sea. On account of its narrow width, this inlet is not used by large vessels; small craft can moor between the piles, with an anchor towards the entrance, and, in a Bora, with a hawser to the shore. 25

About a mile within the entrance, on the south-western side of the inlet, there is a wooden pier with concrete foundations, at which steam vessels can load. Vessels are moored between two buoys there. Small vessels going alongside in a strong wind should let go their starboard anchor and secure to the shore, bows outward to facilitate departure. 30

Small quantities of fresh provisions can be obtained.

Valle Fianona and Porto Albona are the two chief places of export for the produce of the eastern side of the Istrian peninsula. 35

Chart 2711, plan of Porto Albona.

Lights.—A light is exhibited, at an elevation of 36 feet (11^m0), from an iron column, 24 feet (7^m3) in height, on Punta Sant' Andrea (*Lat.* 45° 04' N., *Long.* 14° 10' E.). 40

A light is exhibited, at an elevation of 16 feet (4^m9), from a black iron column, 15 feet (4^m6) in height, on the quay at Porto Albona.

Chart 2711.

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 18 feet (5^m5) in height, on the quay at Valle Fianona. 45

Telegraph cable.—A submarine cable, indicated on the chart, is laid across Il Quarnaro from Porto Albona to Porto di Cherso.

Canale d'Arsa.—The entrance to this channel, page 424, can be identified by Monte Ubas, the summit of which is 298 feet (90^m8) high and is situated about a mile north-north-eastward of the point of that name, and by the village of Carnizza, previously mentioned. Both sides of the channel are steep and partly bare, and are steep to except at Valle Blas, on the western side, about 3½ miles north-north-westward of Punta Ubas, and the northern part of the channel, which are shallow.

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Chart 2711.

Fiume Arsa flows into the channel at its northern end. There is good anchorage for vessels of moderate draught, which can ascend as far as Valdivagna, on the eastern side, about $1\frac{1}{2}$ miles north-north-eastward of Valle Blas. South-easterly winds cause a sea in the entrance, which, however, is not felt beyond 2 miles within. Land and sea breezes blow in the direction of the channel.

The tidal streams and the current of Fiume Arsa are perceptible throughout the channel.

- 10 Punta Zucca lies on the western side, about three-quarters of a mile northward of Punta Grossa. Calavogna is entered between Punta Zucca and a point, on which there is a stone quarry, a short distance farther northward.

Punta Cucizza lies on the eastern side of the channel, about a mile north-eastward of Punta Zucca. Porto Gradaz is entered between Punta Cucizza and a point about three-quarters of a mile north-eastward. The northern foot of Monte Ubas forms the southern side of this port.

- In the south-eastern part of Porto Gradaz, there is a quay, 131 feet (39^m9) long, with a depth of 8 feet (2^m4) alongside.

Punta San Nicolò, on which there is a conspicuous church, lies on the western side of the channel, about half a mile northward of Punta Cucizza and Punta Praschiarizza lies on the same side, about a mile farther north-north-westward. Between the latter point and Punta Cincin, on the eastern side, about 4 cables north-eastward, the channel trends about a mile west-north-westward and then northward. Monte Frumento, 502 feet (153^m0) high, stands on the north-eastern side of the channel, $1\frac{1}{2}$ cables inland, about three-quarters of a mile north-westward of Punta Praschiarizza.

- 30 The village of Traghetto d'Arsa, which contained about 376 inhabitants, in 1940, lies at the head of Valle Rупpa (Rupa), about a mile northward of Monte Frumento. There are two small moles, available for boats, and a Health office at Traghetto d'Arsa.

Valdivagna lies about half a mile northward of Traghetto d'Arsa, close eastward of Punta Bersica; farther northward, a shallow canal leads to the coal mining district.

Pilotage.—Pilotage is optional. If required, authorised pilots can be obtained by application to the Harbour authorities.

- Magnetic disturbance.**—Magnetic disturbance has been observed in Canale d'Arsa, especially off Traghetto d'Arsa.

Telephone cables.—Two submarine telephone cables are laid across Canale d'Arsa, one about three-quarters of a mile northward of the entrance, and the other between Porto Gradaz and Punta San Nicolò.

- 45 **Lights.**—The light on Punta Ubas is described on page 424.

A light is exhibited, at an elevation of 24 feet (7^m3), from a black iron column with a tank at the base, 16 feet (4^m9) in height, on Punta Cucizza (*Lat.* 44° 58' N., *Long.* 14° 04' E.).

- A light is exhibited, at an elevation of 31 feet (9^m4), from a grey cement hut, 21 feet (6^m4) in height, on Punta San Nicolò.

A light is exhibited, at an elevation of 28 feet (8^m5), from a red iron column with a tank at the base, 18 feet (5^m5) in height, on Punta Praschiarizza.

A light is exhibited, at an elevation of 31 feet (9^m4), from a grey

Charts 1440, 2158a.

Chart 2711.

cement hut, 21 feet (6^m4) in height, on the point at the foot of Monte Frumento.

A light is exhibited, at an elevation of 21 feet (6^m4), from an iron tower, 15 feet (4^m6) in height, on the point, a short distance westward of Traghetto d'Arsa. 5

Anchoragees.—Vessels may anchor on either side of Canale d'Arsa, but as the depths increase rapidly towards the middle, Bora squalls would probably cause the anchor to drag considerably before bringing up, and it is therefore advisable to lay out an anchor north-eastward. 10 Vessels anchoring should prefer the eastern shore. The best anchorage for a large vessel is in Porto Gradaz, in depths of from 10 to 18 fathoms (18^m3 to 32^m9); the Bora here is less squally than in the other bays and coves in the channel. Towards the head of Porto Gradaz, the depths decrease rapidly. 15

In Calavogna there is anchorage for small vessels, in a depth of about 10 fathoms (18^m3), but it is exposed to the sea caused by south-easterly and south-westerly winds.

The roadstead off Traghetto d'Arsa can accommodate several large vessels; the bottom consists of gravel, good holding ground. A vessel 20 should anchor as close to the shore as possible to lessen the effect of the Bora. The sea is calm with any wind.

Valdivagna.—Harbour facilities.—At Valdivagna there are two coaling piers and two quays. One pier, situated a short distance eastward of Punta Bersica, extends 230 feet (70^m1) offshore in a south- 25 westerly direction; the head of this pier is 69 feet (21^m0) wide. The other pier, the head of which is 40 feet (12^m2) wide, extends a short distance west-north-westward from Punta Bersica. There is a short quay between these two piers and a quay extends for some distance along the shore northward of Punta Bersica (*Lat.* 45° 02' N., *Long.* 30 14° 03' E.).

Vessels not exceeding 525 feet (160^m0) in length, and drawing not more than 30 feet (9^m1), can proceed to Valdivagna and secure to the pierheads. Vessels drawing from 11 to 18 feet (3^m4 to 5^m5) can secure to the quay between the piers. There are several mooring buoys for 35 the use of vessels at the piers.

For a short distance westward of the pier extending from Punta Bersica the depth is maintained by dredging; farther westward the depths decrease rapidly.

Regulations.—Steam vessels awaiting a berth at Valdivagna 40 should remain at anchor in the roadstead off Traghetto d'Arsa.

The mooring buoys in the vicinity of the piers are for the purpose of securing vessels alongside only.

Eastern side of Il Quarnaro.—Isola Sansego.—This island lies with Punta Margarina, its southern extremity, about 9 miles west- 45 north-westward of the southern extremity of Isola Lussino; the island is usually made by vessels on their way to sight Capo Promontore before proceeding northward. Monte Garbe, its summit, 321 feet (97^m8) high, is crowned by a lighthouse. Isola Sansego appears flat from a distance. It has a sandy soil and is covered with fruit trees, 50 vineyards in terraces, and reeds.

The coast is steep and bold except at the points, which are bordered by banks.

A rocky patch, with a depth of 11 fathoms (20^m1) over it, lies about

Charts 200, 1440, 2158a.

Chart 2711.

three-quarters of a mile west-south-westward of Punta Margarina. A 6-fathom (11^m0) rocky patch lies about 3½ cables east-north-eastward of Punta Arat, the eastern extremity of the island; and a shoal, with a depth of 3½ fathoms (6^m4) over it, lies about 2 cables south-eastward of the same point (*Lat.* 44° 31' N., *Long.* 14° 20' E.).

Three rocky banks lie north-westward of Punta Segarina, the north-western extremity of Isola Sansego; the inner bank, with a least known depth of 5½ fathoms (10^m5) over it, at a distance of half a mile; the middle bank, with a least depth of 6 fathoms (11^m0) over it, at a distance of about a mile; and the outer bank, with a depth of 8 fathoms (14^m6) over it, at a distance of about 2 miles. Secca Ponente, a rocky bank, with a depth of 9 fathoms (16^m5) over it, lies about 1½ miles west-north-westward of the same point. It is advisable to keep clear of these banks to avoid the heavy sea which occasionally breaks.

The village of Sansego, with a church in it, and which contained about 1,656 inhabitants, in 1940, lies at the head of Valle Dragazuali, situated on the north-eastern side of the island. The chief products are wine and fruit.



Isola Sansego lighthouse.

Lights.—A light is exhibited, at an elevation of 358 feet (109^m1), from a square iron tower on a dwelling, 41 feet (12^m5) in height, on the summit of Isola Sansego.

A light is exhibited, at an elevation of 19 feet (5^m8), from a black iron column, 17 feet (5^m2) in height, on the head of the

north-eastern mole in Valle Dragazuali.

Telegraph cable.—**Beacon.**—A submarine cable, indicated on the chart, is laid from Valle Dragazuali to Isola Lussino, the shore end is marked by a beacon.

Anchorages.—**Harbour.**—Shelter from a Bora may be found under the lee of Isola Sansego, south-westward of Monte Garbe, in depths of from 16 to 22 fathoms (29^m3 to 40^m2), sand, taking care to avoid the rocky ground west-south-westward of Punta Margarina. Small craft, in a similar case, can find good shelter in Valle Porto, near the north-western end of the island. Valle Dragazuali is suitable only for small vessels, and being quite open north-eastward should be avoided in Bora weather. A mooring buoy is moored in the cove.

A small artificial harbour, for the most part silted up, formed by two moles, is situated on the north-western side of Valle Dragazuali and affords shelter to small vessels, with local knowledge, drawing not more than 11 feet (3^m4).

Isolotti Canidole.—**Light.**—The channel between Isola Sansego and Isolotti Canidole, northward, is about 2½ miles wide, deep and clear of dangers except the rocky patches off the north-western end of Isola Sansego previously mentioned.

Isolotti Canidole consist of two islets 1½ cables apart and connected by a ridge, with a depth of 3 fathoms (5^m5) over it. The northern islet, Canidole Grande, is 197 feet (60^m0) high; Isolotto Canidole Piccolo is 157 feet (47^m8) high and Scoglio Silo lies about 2 cables

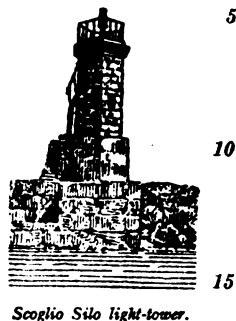
Chart 2711.

off its south-eastern end. The islets are partly wooded and are steep-to.

Shelter may be obtained from a Bora a short distance south-westward of Isolotti Canidole, in depths of from 20 to 22 fathoms (36^m6 to 40^m2), sand.

A light is exhibited, at an elevation of 36 feet (11^m0), from an hexagonal masonry tower, 33 feet (10^m1) in height, on Scoglio Silo (*Lat.* $44^\circ 34' N.$, *Long.* $14^\circ 20' E.$).

Isola Unie.—**Beacons.**—Isola Unie is separated from Isolotti Canidole, south-eastward, by a channel about three-quarters of a mile wide, with a depth of 12 fathoms (21^m9) in the middle. Secca Grossa, having a rock, with a depth of one foot (0^m3) over it, at its north-western end, and a depth of 5 fathoms (9^m1) over its south-eastern end, lies from one to $3\frac{1}{2}$ cables off Punta Grossa, the south-eastern extremity of Isola Unie; the south-eastern side of the rock is marked by a white iron pole beacon, 20 surmounted by a sphere. A vessel taking this channel should avoid this rock by keeping nearer Isolotto Canidole Grande than Punta Grossa.



Scoglio Silo light-tower.

The hills on Isola Unie are from 315 to 453 feet (96^m0 to 138^m1) high, Monte Grossa, the summit, being towards the southern end; 25 the lower parts are covered with grass and brushwood. The village of Unie, which contained about 692 inhabitants, in 1940, is situated about the middle of the western side of the island.

Valle Uruglie, on the south-western side of the island, between Punta Grossa and Punta Unietta, about $2\frac{1}{4}$ miles north-westward, is 30 sheltered from the Bora by a partly wooded chain of hills, of which Monte Grossa is the summit, but, as it is open to all other winds, it should be quitted as soon as the Bora subsides. The sides of this bay are bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which is $2\frac{1}{4}$ cables wide in places. The northern side of the bay is 35 the southern side of a low promontory, over which the village and church of Unie can be seen.

The best anchorage in Valle Uruglie is, in depths of from 10 to 14 fathoms (18^m3 to 25^m6), sand, south-eastward of Punta Unietta, with Unie church bearing 008° ; half a mile nearer Punta Grossa, the bottom 40 is rocky. Small vessels can anchor near the shore.

Between Punta Unietta (*Lat.* $44^\circ 37' N.$, *Long.* $14^\circ 14' E.$) and Punta Art, about three-quarters of a mile northward, the western side of the low promontory, previously mentioned, is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about $2\frac{1}{4}$ cables wide. 45 A shallow spit, with an above-water rock near its outer extremity, extends about $3\frac{1}{2}$ cables north-north-westward of Punta Art; the village of Unie lies at the head of a bay entered between this rock and the coast, about 6 cables north-eastward. The southern side of the bay is bordered by a shallow bank about 2 cables wide. There is a 50 small boat harbour at Unie, formed by a mole extending a short distance offshore in a south-westerly direction and protected northward by a reef. Vessels can anchor north-eastward of the above-water rock forming the south-western entrance point of the bay, in depths of

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Chart 2711.

from 9 to 14 fathoms (16^m5 to 25^m6), sand, with the church bearing about 112°.

Punta Stione (Stiene), close off the northern side of which there is a sunken rock, lies about 1½ miles north-north-eastward of Punta Art. Sunken rocks extend about 2 cables offshore, about half a mile north-eastward of Punta Stione.

Isolotto Samonciel, bare, 59 feet (18^m0) high, and joined to the coast by a narrow 2-fathom (3^m7) bank, is situated nearly midway between Punta Stione and Punta Sottile, the northern extremity of Isola Unie. A rock, just above-water, lies about 2 cables northward of Isolotto Samonciel; this rock is marked by a perch, surmounted by a broom, which is liable to be washed away.

Scoglio Galiola.—Light.—Scoglio Galiola, low and rocky, is situated 5 miles west-north-westward of the northern extremity of Isola Unie. The western side of this rock is steep-to, but the other sides are bordered by a shallow bank which extends a quarter of a mile north-eastward and about 1½ cables south-westward.

A light is exhibited, at an elevation of 69 feet (21^m0), from a white iron octagonal tower on a square dwelling, 69 feet (21^m0) in height, on Scoglio Galiola (*Lat.* 44° 44' N., *Long.* 14° 11' E.).

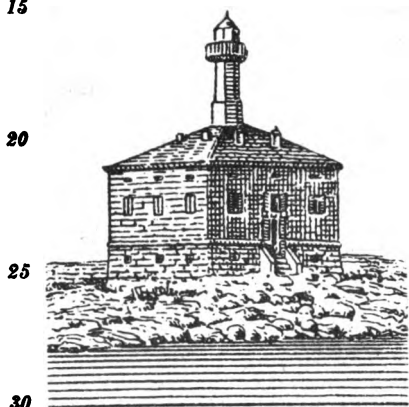
Telegraph cable.—A submarine cable, indicated on the chart, is laid between Scoglio Galiola and Isola Unie.

Isola Lussino.—South-western side.—Beacons.—Isola Lussino consists of mountainous heights united by low isthmuses and at a distance presents the appearance of three islands. Its coastline is generally high, broken and indented, with deep water around it. Monte Calvario, 768 feet (234^m1) high, with a chapel on its summit, lies in the southern part of the island, which is cultivated with vines and olive trees, and provides pasturage for many flocks, the wool of which is exported. The northern part is hilly and barren and about 3 miles from the northern end stands Monte Ossero, one of the most remarkable objects in this part of the Adriatic, *see* page 422.

From Punta Cornu, the southern extremity of Isola Lussino, the coast trends about 4½ miles north-westward to Punta Madonna, the southern entrance point of Porto Cigale, forming several coves; it rises steeply to the range of hills, and is covered with bushes, with olive plantations in places. The Bora here is more moderate than in other localities. From Porto Cigale to Punta Curilla, about 4 miles north-westward, the coast is lower and much indented. The slopes of the peninsula of which Punta Curilla is the south-western extremity, are gentle, partly covered with bushes and partly cultivated.

Chart 1561, plan of Porto di Lussinpiccolo.

Porto Cigale, entered between Punta Madonna and Punta Cigale, 2 cables north-north-westward, is open westward; it is a well sheltered



Scoglio Galiola lighthouse.

Chart 1561, plan of Porto di Lussinpiccolo.

inlet frequented by coasting vessels, and affords shelter to vessels of moderate size. There are a Health office, several villas, a bathing establishment and numerous bollards. A chapel on Punta Madonna and the church of Santa Maria, in the town of Lussinpiccolo, about half a mile eastward of the port, are conspicuous. There is a small mole, with a depth of about 13 feet (4^m0) at its head, on the eastern side of Punta Cigale, just within the entrance.

The best anchorage is, in a depth of 10 or 11 fathoms (18^m3 or 20^m1), sand, good holding ground, about 1½ cables south-westward of the Health office.

The shore end of the submarine cable from Isola Sansego, page 428, is landed at the head of Valle d'Argento (Zaboicie), on the northern side of Punta Cigale, and is marked by a beacon.

Isolotto Colludarz, 174 feet (53^m0) high and covered partly with olive trees and partly with bushes, lies with its southern end about a mile north-westward of Punta Cigale; the south-eastern end of this islet is separated from Isola Lussino by Bocca Falsa a narrow passage leading into Golfo di Lussinpiccolo; there is a depth of 5 feet (1^m5) in the fairway of this passage, which is marked by two pairs of concrete beacons; the inner pair are 66 feet (20^m1) apart and each is surmounted by a black ball. There are sunken rocks on each side of the passage.

Isolotto Mortar, 82 feet (25^m0) high and covered with grass, lies a short distance westward of Isolotto Colludarz and is connected to the northern end of that islet by a shallow bank. See view on chart 1561 and view on chart 2711.

Bocca Vera (Grande), between Punta Croce, the northern extremity of Isolotto Colludarz, and Punta Torunza, 2½ cables north-north-westward leads into Golfo di Lussinpiccolo, page 432.

Valle Artatorre is entered between Punta Torunza and Punta Salsina, about three-quarters of a mile westward; its sides are bordered by a narrow, shallow bank. Monte Castello, 269 feet (82^m0) high, stands on the eastern side of this bay; large vessels can anchor south-westward of Monte Castello, in a depth of 9 fathoms (16^m5), sand, good holding ground. Southerly and south-westerly winds cause a heavy sea in the bay.

Isolotto Zabodaschi, 65 feet (19^m8) high, lies about three-quarters of a mile westward of Isolotto Mortar and 3 cables offshore, about 1½ miles west-south-westward of the entrance into Golfo di Lussinpiccolo. This islet is surrounded by a bank, with depths of less than 5 fathoms (9^m1) over it, which is about half a cable wide on its south-eastern and northern sides.

Chart 2711.

Punta Bianca, about 4 cables west-north-westward of Isolotto Zabodaschi, can be distinguished by its whitish colour. Punta Curilla, the south-eastern entrance point of Canale di Unie, page 433, lies about a mile west-north-westward of Punta Bianca.

Chart 1561, plan of Porto di Lussinpiccolo.

Lights.—A light is exhibited, at an elevation of 42 feet (12^m8), from a white octagonal stone hut, 28 feet (8^m5) in height, on Punta Madonna (Lat. 44° 32' N., Long. 14° 27' E.).

A light is exhibited, at an elevation of 33 feet (10^m1), from an octagonal tower with a dwelling adjoining, 29 feet (8^m8) in height, on the western extremity of Isolotto Mortar.

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Chart 1561, plan of Porto di Lussinpiccolo.

A light is exhibited, at an elevation of 33 feet (10^m1), from a white octagonal concrete tower, 23 feet (7^m0) in height, on Punta Croce.

A light is exhibited, at an elevation of 32 feet (9^m8), from a grey octagonal concrete tower, 23 feet (7^m0) in height, on Punta Torunza.

Golfo di Lussinpiccolo.—This inlet is situated at the lowest and narrowest part of Isola Lussino. The entrance, page 431, is faced by Monte Asino, 410 feet (125^m0) high, which has a ruin on its summit. A bank, with depths of less than 5 fathoms (9^m1) over it, extends
10 about three-quarters of a cable northward of Punta Croce, and a similar bank extends nearly half a cable south-eastward of Punta Torunza.

Golfo di Lussinpiccolo has no hidden dangers and is considered one of the best and most convenient harbours in the northern Adriatic ; its south-eastern and north-western ends are shallow. The bottom
15 mostly consists of mud and weed, good holding ground, but is rocky in the entrance ; along the north-eastern side of Isolotto Colludarz ; along the south-western side of the gulf, under Guardia Grande (M. Velo Straza), a hill, 213 feet (64^m9) high, situated about 1½ miles south-eastward of Punta Croce ; and along the north-eastern shore, on both sides
20 of the isthmus, situated about 1½ miles south-eastward of Monte Asino.

The north-eastern side of the inlet is backed by a range of hills, which decrease in height from Monte Asino to the isthmus ; about 2 cables farther south-eastward, there are two windmills, one of which is in ruins.

25 Valle Covzagna is situated at the north-western end of the inlet. Punta Pogliana (Poliana) lies on the north-eastern side, about half a mile south-eastward of Punta Croce ; and the Harbour master's office, where a small mole projects, is situated about 1½ miles farther south-eastward. From the Harbour master's office, the shore is lined
30 with quays to the head of the harbour and thence for a short distance along the south-western side. Molo Orsini, about half a cable long, with depths of about 16 feet (4^m9) along its south-western side, projects a short distance from the general line of the quays, about 2 cables south-eastward of the Harbour master's office. There are several
35 mooring buoys in the harbour.

Pilots.—Experienced seamen, with local knowledge, who can act as pilots, can always be found ; enquiries should be made at the Harbour master's office.

Lights.—Two lights, vertically disposed, are exhibited, at elevations of 26 and 18 feet (7^m9 and 5^m5), respectively, from a red iron framework structure, 28 feet (8^m5) in height, on Punta Pogliana (*Lat.* 44° 33' N., *Long.* 14° 26' E.).

Two lights are exhibited, each at an elevation of 18 feet (5^m5), from a red iron column, 15 feet (4^m6) in height, one at the north-western
45 corner and the other at the southern corner of Molo Orsini.

Anchorage.—Large vessels can anchor almost anywhere in Golfo di Lussinpiccolo, avoiding the rocky places previously mentioned. There is a berth in mid-channel about 1½ cables westward of Punta Pogliana, in a depth of 11 fathoms (20^m1). If a vessel is only awaiting
50 a change of weather, she can anchor in a depth of 8 or 9 fathoms (14^m6 or 16^m5), in Valle Covzagna, under Monte Asino.

A vessel is recommended to avoid the area extending about half a mile north-westward from abreast the Harbour master's office ; in this area the full force of the Bora is felt and the holding ground is bad.

Charts 2711, 200, 1440, 2158a.

Chart 1561, plan of Porto di Lussinpiccolo.

Directions.—When bound to Lussinpiccolo, the lowest part of Isola Lussino should be steered for, and, on near approach, the town, which is on a hill at the south-eastern end of the harbour, will be plainly seen. The ruin on Monte Asino, bearing 049°, leads through Bocca Vera ; Punta Croce should be rounded at a distance of not less than a cable, after which a course may be steered direct for the town. 5

A vessel from north-westward can also use the passage between Punta Bianca and Isolotto Zabodaschi. At night, the vessel should keep in the *white* sector of Punta Torunza light between the bearings of 066° and 072°, which leads through this passage, care being taken to avoid the bank extending northward of Isolotto Zabodaschi, the outer edge of which lies just within the southern limit of this sector. 10

Town.—Communications.—Lussinpiccolo contained about 3,862 inhabitants, in 1940. There is very little cultivation in the neighbourhood, and what there is requires the protection of numerous stone walls, as the Bora frequently blows with great violence during the winter months. Owing to its mild climate, Lussinpiccolo has become a winter health resort. 15

The exports consist of fresh and preserved fish and wine ; provisions form the chief imports. 20

There is regular steamer communication with other ports in the Adriatic.

Port facilities.—There is a small hospital in the town.

Fresh provisions can be obtained. 25

There is a building and repairing yard for small vessels.

The services of a tug may be obtained by application to the Port authorities.

Chart 2711.

Canale di Unie.—Beacon.—This large and partially landlocked space, between Isole Unie and Canidole, on the western side, and Isola Lussino, on the eastern side, affords a safe refuge to the numerous fishermen of this part of the Adriatic, who affirm that a large fleet might ride out a gale here in complete security. The bottom consists of sand and mud. 30 35

The current in this channel is tidal and affected by the winds. With a persistent Scirocco, the flood stream sometimes attains rates of from 2 to 2½ knots.

Canale di Unie is entered from southward between Punta Curilla, page 431, and Scoglio Silo (*Lat. 44° 34' N., Long. 14° 21' E.*), about a mile west-south-westward. 40

The light on Scoglio Silo is described on page 429.

On the eastern side of the channel, from Punta Curilla, the western coast of Isola Lussino trends 9 miles north-north-westward to Punta Ossero, the northern, rocky part rising steeply from the sea to Monte Ossero, page 422. 45

A 6-fathom (11^m0) patch lies about half a mile north-westward of Punta Curilla.

Scoglio Carbarus, 10 feet (3^m0) high and bare, lies about 1½ miles northward of Punta Curilla and a quarter of a mile offshore ; it is connected to the coast, eastward, by a shallow, rocky bank ; the depths are considerable at a short distance outside this rock.

Porto Lovo, situated on the eastern side of a point lying half a mile east-north-eastward of Scoglio Carbarus, affords shelter to small vessels

Chart 2711.

in southerly winds, but is rather exposed to the Bora. Vessels anchor in the inner part and, in a Bora, lay out a hawser to the eastern shore. In the northern approach to Porto Lovo, about 2 cables north-west-ward of the eastern entrance point, there is a rocky shoal, with a depth of 5 fathoms (9^m1) over it, which is steep-to.

Valle Tomosina, 3 miles northward of Porto Lovo, affords shelter to small craft in easterly winds, over a bottom of fine sand, good holding ground. The two coves between this cove and Porto Lovo are not suitable for anchorage.

On the western side of the channel, Punta Marazzid (Marazuol) lies about 2½ miles north-north-westward of Punta Grossa, page 429. Porto Lungo, which lies westward of Punta Marazzid, affords shelter to small craft in its inner part from all winds except the Scirocco. There is a small mole on the south-western side of the port and bollards on the north-eastern side. The best anchorage is, in depths of from 4 to 5 fathoms (7^m3 to 9^m1), south-eastward of the mole.

Porto Mezzo and Porto Fogon, which lie between Punta Marazzid and Punta Limaran, about a mile north-north-eastward, afford shelter against westerly and north-westerly winds, but are open south-eastward.

Isolotto dei Sorci, 33 feet (10^m1) high, lies 2 cables north-eastward of Punta Limaran; Secca dei Sorci, with a depth of 1½ fathoms (2^m3), rock, over it, lies about 2 cables farther north-eastward; both islet and shoal lie close to the coast.

Canale di Unie is entered from northward between Punta Sottile, page 430, and Punta Ossero, about 3 miles north-eastward. The land southward of Punta Ossero rises to an elevation of 531 feet (161^m8) within half a mile.

A rock, with a depth of less than 6 feet (1^m8) over it, lies a short distance northward of Punta Ossero. This rock is marked by an iron pole beacon, surmounted by a red sphere (*Lat.* 44° 43' N., *Long.* 14° 20' E.).

Telegraph cable.—A submarine cable, indicated on the chart, is laid across Canale di Unie between Porto Lovo and Punta Grossa.

Baia di Ossero.—**Light.**—Baia di Ossero is entered between Punta Ossero and Punta Miklen, on the western coast of Isola Cherso, about 2½ miles north-eastward. At its head, this bay communicates with Canale di Lussino, page 391, through Canale di Ossero.

The south-western side of Baia di Ossero is indented with small bays unsuitable for anchorage. Scoglio Secca lies close off a point, situated 3½ cables eastward of Punta Ossero. A shoal, with a depth of 8 feet (2^m4) over it, lies close off a point situated, at the head of the bay, close westward of the entrance to Canale di Ossero.

Porto Vier, situated on the eastern side of the head of the bay, affords shelter to small vessels from all winds. In this port, there are two small moles, forming a boat harbour, and a mooring buoy.

A light is exhibited, at an elevation of 22 feet (6^m7), from a red iron column, 15 feet (4^m6) in height, on the northern entrance point of Porto Vier.

A vessel entering Porto Vier should pass not less than a quarter of a cable off the northern entrance point, in order to avoid a rocky shoal extending from it.

Anchorage.—Baia di Ossero affords good anchorage for vessels of any size, in depths of from 24 to 27 fathoms (43^m9 to 49^m4), hard mud,

Charts 200, 1440, 2158a.

Chart 2711.

at a distance of a mile north-north-westward of the town, or farther southward. Large vessels can anchor westward of the light-column at Porto Vier, in depths of from 22 to 25 fathoms (40^m2 to 45^m7).

Town.—The town of Ossero, which contained about 321 inhabitants, in 1940, stands on a hill on Isola Cherso close to Isola Lussino, to which it is connected by a swing bridge. The belfry of the church in the town is conspicuous.

Canale di Ossero.—**Telegraph cable.**—This channel, mentioned on page 391, lies between Isola Cherso, on its eastern side, and the northern end of Isola Lussino, on its western side. The channel is from 20 to 26 feet (6^m1 to 7^m9) wide, and about 1,148 feet (349^m9) long, with a depth of about 8 feet (2^m4). It is available for small vessels, with local knowledge.

A submarine cable, connecting Isole Cherso and Lussino, is laid across the southern end of the channel.

Isola Cherso.—The coasts of this island are steep; a chain of mountains extends along its whole length. Monte Sis, 2,093 feet (638^m0) high, situated about 6½ miles from the northern end, is the summit. The centre of the island is lower and rises again to Monte Chelm, 1,585 feet (483^m1) high, standing about 12 miles southward of Monte Sis and about half a mile inland from the western coast, whence the peaks gradually decrease in elevation towards the southern end.

The northern coast is steep and partly wooded; its eastern part, exposed to the Bora, is bare and almost uninhabited.

The western coast is indented; its northern part is studded with villages and it is nearly all either cultivated with vines and olive trees or wooded. This side of the island is sheltered from the Bora and has several harbours and safe anchorages.

For the eastern side of Isola Cherso *see* pages 394. 406 and 421.

Isola Cherso produces wine, olives and firewood. The fishing industry is active.

Western side of Isola Cherso.—**Light.**—Porto Ustrine is entered between Punta Miklen, page 434, and Punta Ustrine, about half a mile north-westward; there is anchorage for small craft in the northern part of this port, in a depth of 5 fathoms (9^m1), mud, good holding ground, and sheltered from all winds. Cala Camisa lies close eastward of Punta Miklen. Porto Ustrine may be identified by the village of Ustrine, at an elevation of 590 feet (179^m8), a short distance eastward of it; the southern entrance point is whitish and northern bare and dark.

Punta Tilia lies about 4½ miles north-north-westward of Punta Ustrine (*Lat.* 44° 45' N., *Long.* 14° 23' E.).

Porto San Martino, the entrance to which is about half a mile wide, and open southward, lies eastward of Punta Tilia. The sides of this bay are bordered by a narrow bank, with depths of less than 5 fathoms (9^m1) over it; the head of the bay is shallow. Large vessels can anchor in the entrance, in a depth of about 22 fathoms (40^m2); there is good anchorage for vessels of medium size, in depths of from 6 to 15 fathoms (11^m0 to 27^m4), mud; small craft can anchor about 2 cables south-south-eastward of the mole in a depth of about 6 fathoms (11^m0). Vessels, with local knowledge, can secure to the mole. The bay is somewhat protected south-westward by Isolotto Levrera. The Bora blows with very violent squalls, and often sets in without warning.

Charts 200, 1440, 2158a.

Chart 2711.

The passage into Porto San Martino, northward of Isolotto Levrera, is about $1\frac{1}{2}$ miles wide and clear of dangers.

The village of San Martino, which contained a population of about 545, in 1940, lies at the head of the bay, and has a small mole and some masonry bollards. The church of San Nicola, painted in light and dark stripes, and situated on the eastern side of the bay, southward of the village, and a white chapel, on a hill, about half a mile farther south-eastward, are conspicuous.

10 A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 16 feet (4^m9) in height, on the molehead at San Martino (*Lat. $44^\circ 49' N.$, Long. $14^\circ 21' E.$*).

Tunny fisheries.—From March to October, tunny nets, varying in length from about 500 feet to 650 feet (152^m4 to 198^m1), are laid off 15 Cala Camisa and Porto San Martino. See page 49.

Off-lying islets.—**Danger.**—Isolotto Levrera lies with Punta Tanka, its northern extremity, about $1\frac{1}{2}$ miles south-south-westward of Punta Tilia. This islet is 220 feet (67^m1) high at its southern end and is thinly covered with grass. Owing to its light colour it 20 shows up well against the coast of Isola Cherso. Both sides of this islet are bordered by shallow banks, on which there are above-water rocks, and which extend about 2 cables offshore; depths of less than 5 fathoms (9^m1) extend about $1\frac{1}{2}$ cables off its northern and southern ends. A rocky bank, with a depth of 9 fathoms (16^m5) over it, lies 25 about a mile northward of Isolotto Levrera.

Isolotto Visochi, 24 feet (7^m3) high, lies eastward of Isolotto Levrera and about three-quarters of a mile off the coast of Isola Cherso; except on its north-western side, this islet is bordered by a shallow rocky bank, as much as 2 cables wide in places. About a quarter of a mile 30 north-westward of Isolotto Visochi there is a 7-fathom (12^m8) patch, and three-quarters of a mile north-north-westward of the islet there is a 5-fathom (9^m1) patch; between these patches, there is one, with a depth of 8 fathoms (14^m6) over it.

A light is exhibited, at an elevation of 37 feet (11^m3), from a red 35 conical tower with white stripes, 25 feet (7^m6) in height, on the south-western side of Isolotto Levrera.

Coast.—**Light.**—From Punta Tilia, the coast trends $8\frac{1}{2}$ miles north-north-westward to Punta Pernata. Monte Chelm, page 435, about 3 miles northward of Punta Tilia, and the village of Lubenizze, 40 with a belfry at its southern end and a white chapel at its northern end, elevated 1,240 feet (377^m9), about $1\frac{1}{2}$ miles farther northward, are conspicuous.

Punta Zaglava, about 6 miles north-north-westward of Punta Tilia, projects north-westward from a promontory which extends half a mile 45 south-westward and terminates in Punta Preslo. This promontory can be identified by a ruin on it, at an elevation of 302 feet (92^m0). Valle Zaglava and Valle Miracine, situated on the northern and southern sides, respectively, of the promontory, are unsuitable for anchorage.

Scoglio Zaglava, lying about 6 cables north-westward of Punta 50 Zaglava, rises near the south-western end of a rocky shoal, over which there are depths of from $1\frac{1}{2}$ to 2 fathoms (2^m7 to 3^m7), and which extends about $1\frac{1}{2}$ cables northward of it, and has a depth of $4\frac{1}{2}$ fathoms (8^m7) at its outer end. A bank, with a depth of 7 fathoms (12^m8) at its outer end, extends about 4 cables south-westward of Scoglio

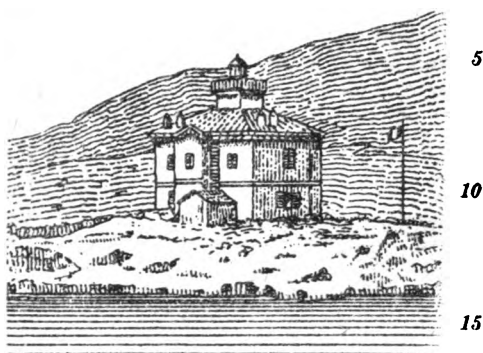
Charts 1440, 2158a.

Chart 2711.

Zaglava. The channel between Scoglio Zaglava and Isola Cherso is about 4 cables wide.

A light is exhibited, at an elevation of 65 feet (19^m8), from a square tower on a dwelling, 49 feet (14^m9) in height, on Scoglio Zaglava (*Lat.* 44° 55' N., *Long.* 14° 17' E.).

Punta Pernata, bare, and one of the most remarkable points on Isola Cherso, lies about 2½ miles north-north-eastward of Scoglio Zaglava; this point together with Madonna chapel, elevated 761 feet (232^m0), about a mile southward, is conspicuous against the background. An iron framework structure, painted with red and white diagonal stripes, stands on the northern extremity of the point. About 1½ miles southward of this point the land rises to an elevation of 1,020 feet (310^m9) in Monte Grabovizza.



Scoglio Zaglava lighthouse.

Baia di Cherso.—This bay is entered between Punta Pernata and Punta San Biagio, about 3½ miles north-north-eastward. The sides of the bay are steep-to, except in the south-eastern part where they are bordered in places by narrow banks, with depths of less than 5 fathoms (9^m1) over them; the shores are backed in places by cultivation. The bay is open to northerly and north-westerly winds, and the Bora is severely felt. Should a large vessel, however, find occasion to anchor in this bay, the best berth is about 4 cables from the eastern shore, in a depth of about 27 fathoms (49^m4), good holding ground, just southward of Valle Nedomisie, situated about 4 miles south-eastward of Punta San Biagio. The best anchorage for small craft is in that cove, where the depth in the entrance is 5½ fathoms (9^m6); they can also anchor off some houses in Valle Tonerà, situated on the eastern side of the head of the bay. Net fishing is carried on in this bay, and care should be taken to avoid the nets. The village of Vallone lies on the western side of the head of the bay and contains some large buildings. Monte Persca (Prisca), 1,407 feet (428^m9) high, stands about 2 miles south-eastward of Vallone.

Chart 1561, plan of Port Cherso.

Porto di Cherso.—**Lights.**—Porto di Cherso, an inlet on the eastern side of Baia di Cherso, eastward of Punta Pernata, is, though small, an excellent harbour. It is entered between Punta Sant' Anselmo and Punta Covacina, about 3 cables northward. The depths gradually decrease towards the head of the inlet and the bottom consists of mud. It is bordered by a shallow bank, which extends half a cable from Punta Rotonda del Molino, on the northern side, 6½ cables within the entrance, and becomes wider round the north-eastern side of the harbour, and fills up the south-eastern part for a distance of 3½ cables from the head.

A mole, 164 feet (50^m0) long, projects south-westward from the southern end of the town, about 2½ cables north-eastward of Punta

Charts 1440, 2158a.

Chart 1561, plan of Port Cherso.

Rotonda del Molino; there are depths of from 18 to 11 feet (5^m5 to 3^m4) alongside this mole. North-north-westward of the mole there is a small harbour, with depths of from 10 to 14 feet (3^m0 to 4^m3) in the middle. It is protected southward by two moles, has a masonry quay, numerous bollards, and, in front of the town, a basin for small craft, in which there are depths of from one to 6 feet (0^m3 to 1^m8).



15 *Punta Covacina light-structure.*

A light is exhibited, at an elevation of 25 feet (7^m6), from a red iron structure on a red hut, 20 feet (6^m1) in height, on the head of a small mole extending from Punta Covacina.

A light is exhibited, at an elevation of 30 feet (9^m1), from a white octagonal concrete tower,

21 feet (6^m4) in height, on Punta Sant' Anselmo (*Lat. 44° 57' N., Long. 14° 24' E.*).

A light is exhibited, at an elevation of 23 feet (7^m0), from red iron column on a stone base, 16 feet (4^m9) in height, on Punta Rotonda del Molino.

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 16 feet (4^m9) in height, on the head of the harbour mole at Porto di Cherso.

25 **Anchorage.**—Porto di Cherso is accessible to vessels of any size, and affords shelter from all winds; the Bora and Scirocco occasionally blow hard. Large vessels can anchor about 2½ cables westward of San Benedetto convent, situated on the eastern side of the harbour, in depths of from 8 to 11 fathoms (14^m6 to 20^m1), mud, good holding ground, but a mooring buoy, lying about 2½ cables westward of this convent may foul this berth. Vessels must not anchor southward of an imaginary line joining Punta Sant' Anselmo and San Benedetto convent, as the southern part of the harbour is occupied by oyster beds. Small vessels can moor in the small harbour north-north-westward of the mole, also westward of Punta Kimen (Chimen), on the northern side of the entrance channel, or off the Health office on the north-eastern side of the harbour, with a hawser to the shore; they also lie well in Valle Gausa, the bight close northward of the entrance, see chart 2711.

40 A vessel entering at night, after passing between the entrance points, should keep the light on Punta Covacina in sight, bearing about 298°, astern, in order to pass southward of the foul ground on the northern side of the channel.

45 **Town.**—The town of Cherso, which contained about 3,600 inhabitants, in 1940, is built round the inner harbour. A limited quantity of fresh provisions can be obtained. Small repairs can be executed. There are two yards for the building and repair of coasting vessels.

Cherso is in frequent steamer communication with other ports in the Adriatic.

50 *Chart 2711.*

Telegraph cable.—A submarine cable, indicated on the chart, is laid across Il Quarnaro from Porto di Cherso to Porto Albona.

Coast.—Between Punta San Biagio and Punta Prestenizze, about 8 miles north-north-westward, the coast is precipitous, and broken,

Charts 2711, 1440, 2158a.

Chart 2711.

with several streams visible from seaward. A conspicuous chapel stands close northward of Punta San Biagio.

CANALE DELLA FARESINA.—This channel connects Il Quar-
naro with Golfo di Fiume. Its western side is the coast of Istria 5
between Punta del Gatto, page 422, and Punta Sip, about $4\frac{1}{4}$ miles
north-north-eastward; its eastern side is the northern part of the
western coast of Isola Cherso between Punta Prestenizze and Punta
Iablanaz (Jablanaz), the northern extremity of that island. The
channel is deep and clear of dangers and has a least width of about 10
 $2\frac{1}{4}$ miles.

Both sides of the channel are partly bare and partly wooded. It is
possible to anchor, in fine weather, almost anywhere, over a bottom of
mud and sand, generally good holding ground, except close northward
of Punta Lovich, situated about half a mile northward of Punta del 15
Gatto, where a rocky shoal extends a short distance offshore.

The current is generally south-going, except with a strong Scirocco ;
with strong northerly winds, the south-going current sometimes attains
a rate of 4 knots.

On the eastern side of the channel, Valle Faresina, with the village 20
of the same name at its head, lies about three-quarters of a mile north-
north-eastward of Punta Prestenizze. In this cove, which is accessible
to small craft, with local knowledge, there is a small mole, with a depth
of 16 feet (4^m9) at its head, and a mooring buoy.

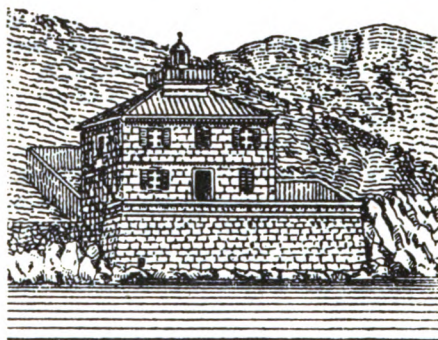
Valle Bagna, situated about a mile south-westward of Punta Iablanaz, 25
affords shelter to small vessels with winds between east and south,
but is open to other winds. There is a small mooring buoy in the
bay.

On the western side of the channel, the village of Bersezio, situated
a short distance west-south-westward of Punta Sip, is conspicuous. 30

Lights.—Telegraph cables.—Beacons.—A light is exhibited
at an elevation of 56 feet
(17^m1), from a two-storied
dwelling, 47 feet (14^m3) in
height, on Punta Presten-
izze (*Lat.* $45^\circ 07' N.$, *Long.*
 $14^\circ 17' E.$).

A light is exhibited, at an
elevation of 20 feet (6^m1),
from a red iron structure,
16 feet (4^m9) in height, on
the head of the mole at
Faresina.

Three submarine cables,
indicated on the chart, are
laid across Canale della
Faresina from Isola Cherso
to the coast of Istria. The shore ends of these cables are marked by
beacons. Vessels are cautioned against anchoring in the vicinity of
these cables. 50



Punta Prestenizze lighthouse.

GOLFO DI FIUME.—General remarks.—Golfo di Fiume,
called Riječki zaliv by the Yugoslavs, is bounded eastward by the

Charts 1440, 2158a.

Chart 2711.

north-western coast of Otok Krk; northward by the mainland coasts of Yugoslavia and Istria; and westward by the eastern coast of Istria.

- 6 There are three channels of approach:—Tihi Kanal, page 419, at the eastern side; Krčki kanal, page 421, from southward; and Canale della Faresina, page 439, from south-westward.

Eastern side of gulf.—Beacon.—The north-western coast of Otok Krk, between Rt Glavotok, page 421, and the northern extremity of the island, has several large and small bays, and, except in the northern part, is wooded.

- Uvala Čavlena, entered between Rt Glavotok and Rt Pelova, 2½ miles north-eastward, is the southernmost anchorage in Golfo di Fiume. The wooded land rises at a moderate slope and the coast is 15 rugged and steep-to, excepting a bank, with a depth of less than 5 fathoms (9^m1) over it, bordering the southern side of the bay from three-quarters of a mile to 1½ miles eastward of Rt Glavotok, and a similar bank bordering the coast from Rt Pelova for a distance of about three-quarters of a mile south-south-westward. The latter 20 point is high, rounded and wooded; Mount Beli, 220 feet (67^m1) high, stands about 8 cables southward of it. For anchorage, see page 441.

Malinska road is situated at the head of a bay which is entered between Rt Pelova (*Lat.* 45° 08' N., *Long.* 14° 29' E.) and Rt Čuf, about 2½ miles north-eastward. The wooded land rises symmetrically 25 and not very steeply. The village of Malinska lies at the eastern side of the bay and half a mile southward of it, inland, is the village of Bogović (Rogović); on the summit of Mount Sveti Petar, 837 feet (255^m1) high, standing 2 miles south-eastward of Malinska, there is a church. Rt Pelova is a good mark for Malinska road.

- 30 Off the village of Malinska there is a small harbour formed by a mole extending about 40 yards (36^m6) south-westward from its north-eastern entrance point, and a shorter mole extending north-north-westward from its south-western entrance point. There are depths of from 8 to 12 feet (2^m4 to 3^m7) in the outer part of the harbour, but the 35 head is shallow. Small craft can berth along the southern side of the north-eastern mole or at its head.

There is a conspicuous yellow house with a tower and a red roof on the south-western entrance point. A shallow sandbank extends about 60 yards (54^m9) off the south-western entrance point; the outer edge 40 of this bank is marked by an iron pole beacon, with a black and white topmark. A vessel should pass northward of this beacon when entering the harbour. There is a mooring buoy off the head of the north-eastern mole. For anchorage, see page 441.

- Luka Kijac, about 4 cables eastward of Rt Čuf, is small and open 45 northward; it affords excellent anchorage for small vessels, especially in a Scirocco, the bottom is sand and mud; in a Bora they can anchor near the eastern side and lay out a hawser ashore. The shores are wooded and the eastern side is steep.

Beli Kamik road is situated off the village of Njivice, which lies 50 about 1½ miles north-eastward of Rt Čuf. The shore hereabouts is wooded and, in the neighbourhood of Njivice, cultivated. The chapel in Njivice and Kapric house, about half a mile north-north-eastward, are conspicuous. At Njivice there is a small mole projecting north-eastward, into a depth of about 1½ fathoms (3^m2), to the eastern side of

Chart 2711.

which small craft can secure, bows on. The coastal steamers call here. For anchorage, *see* below.

Tanki rt (*Lat.* 45° 14' N., *Long.* 14° 32' E.), the termination of a peninsula, 160 feet (48^m8) high, projecting north-north-westward, lies about 4 miles northward of Njivice; a 3-fathom (5^m5) spit extends about 2 cables north-north-westward of Tanki rt, and a shoal, with a depth of 6 fathoms (11^m0) over it, lies about half a mile west-north-westward of the same point.

Omišaljski (Omišalj) zaliv, open north-westward, is entered between Tanki rt and Rt Kijac (Kiač), about half a mile north-eastward. The western side of the bay, formed by the peninsula just mentioned, is bare, steep and rugged. On the northern side of Rt Kijac, a bank, with a depth of 1½ fathoms (3^m2) over it, extends about 1½ cables offshore. A rocky bank, with a depth of 1½ fathoms (2^m7) over it, extends about 1½ cables off the eastern side of the bay, about three-quarters of a mile south-south-eastward of Rt Kijac. The head of the bay is shallow.

On the eastern side of the head of Omišaljski zaliv, there is a small harbour, formed by a rocky projection extending north-westward from the middle of the head of the bay and a small mole extending south-eastward from a projection on the eastern side of the bay. Small craft can berth along the south-western side of this mole, where there are depths of about 2½ fathoms (4^m1). For anchorage, *see* below.

The village of Omišalj, which contained 1,960 inhabitants, in 1931, is situated on a hill, close eastward of the harbour.

Otok Sveti Marko is described on page 420.

Light.—A light is exhibited, at an elevation of 18 feet (5^m5), from an iron column, 15 feet (4^m6) in height, on the head of the north-eastern mole at Malinska.

Anchorage.—Uvala Čavlena affords tolerably good shelter from the Bora, and is protected by Isola Cherso from south-westerly winds; it is only exposed to northerly and north-westerly winds. Large vessels should anchor under the coast south-westward of Mount Beli, at a distance of about 3 cables offshore, in depths of from 22 to 25 fathoms (40^m2 to 45^m7), sand and mud, good holding ground; small vessels can anchor farther in, with a hawser to the shore north-eastward.

Malinska road is recommended as an anchorage, in spite of its great depth. North-westerly winds are troublesome, but although they sometimes occasion a considerable sea, they are not dangerous. Vessels of deep draught, in a Scirocco, anchor south-westward of the village of Malinska, in depths of 17 or 18 fathoms (31^m1 or 32^m9), at a distance of about 2 cables offshore; but in a Bora they anchor directly in front of Malinska harbour with a hawser laid out north-eastward to a bollard. Small vessels can moor in the harbour, or in the small cove by the houses of Vantačić, about a mile west-south-westward of the harbour, on the southern side of the road.

In Beli Kamik road, large vessels can anchor westward of Njivice, in a depth of about 10 fathoms (18^m3), sand and mud, good holding ground; small vessels can moor southward of Kapric house, in a depth of about 6 fathoms (11^m0). With winds from the western semicircle, a vessel should neither anchor nor remain in this road, which is exposed to all winds from north, through west, to south.

Omišaljski zaliv is a good place of refuge against wind and sea from

Charts 1440, 2158a.

Chart 2711.

all directions, except north-west ; there is space for a number of vessels of the largest size on the eastern side, but the Bora is sometimes felt at this anchorage. The bottom is mud and sand and is tolerably
 5 reliable. Large vessels normally anchor in the middle of the bay, but, in the unfavourable season, nearer the eastern side and lay out a hawser to a boulder ; small vessels moor in the south-eastern part of the bay.

Chart 2711, with plan of Bakar bay.

- 10 **North-eastern side of gulf.—Lights.—Signal station.**—On the north-eastern side of Golfo di Fiume, the channel leading into Bakarski (Bakar) zaliv, page 443, is entered between Rt Oštro, situated about a mile northward of Otok Sveti Márko, and Sršica (Sršćica) point, 4 cables farther north-westward. The land rises gently at Rt Oštro,
 15 which is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, extending about a cable north-westward. At Sršica point, which is steep-to, the land rises steeply ; but a rocky patch, with a depth of 5 fathoms (9^m1) over it, lies about 2½ cables west-south-west-
 20 ward of it and a cable offshore.

A light is exhibited, at an elevation of 50 feet (15^m2), from a white circular tower, with red bands, on a dwelling, 46 feet (14^m0) in
 25 height, on Rt Oštro (*Lat.* 45° 16', *Long.* 14° 34' E.).

There is a signal station on Rt Oštro.

Chart 2711.

- 30 The harbour of Urinj lies on the north-eastern side of a small projection situated about 1½ miles west-north-westward of Sršica point. A mole extends a short distance eastward and then southward from the projection ; small craft, with local knowledge, can secure to the
 35 mole. South-easterly and south-westerly winds cause a heavy swell in the harbour.

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron structure, 8 feet (2^m4) in height, on the angle of the mole at Urinj harbour.

Chart 1996.

- Luka Martinšćica, the entrance to which is about 1½ cables wide, is situated about 2½ miles north-westward of Urinj harbour. The entrance can easily be identified by the high point on the south-eastern side ; by the reddish coloured, steep sides of the quarry between
 45 that point and Uvala Žurkovo, 4 cables south-eastward ; and by Sveti Križ, a hill, 676 feet (206^m0) high, with a chapel on its summit, about a mile north-north-eastward of the entrance.

- Martinšćica is the quarantine harbour for Sušak and conspicuous Lazaretto buildings lie at its head. The inner half of the south-eastern
 50 side of the harbour is quayed, and there is a small mole projecting from this quay near the head of the harbour, to the northern side of which small craft and boats can secure. On the north-western side, a short distance within the entrance, there is a factory with a quay to which small vessels can secure ; northward of this quay there is a boat-build-



Rt Oštro Lighthouse.

Charts 1440, 2158a.

Chart 1996.

ing yard. There is a mooring buoy off the boat-building yard and another near the head of the harbour.

Vessels can anchor off the masonry quay of the Lazaretto and lay out hawsers ashore; the holding ground of mud is good. Small vessels 5
moor along the eastern side on account of the Bora.

The coast between Luka Martinšćica and the mouth of Rečina river, about 1½ miles west-north-westward, was being developed in 1935.

The harbours of Sušak and Fiume are described on pages 445 and 446, respectively. 10

Chart 2711, plan of Bakar bay.

Bakarski zaliv.—General remarks.—Bakarski zaliv is a land-locked basin approached by a short channel, the entrance to which is described on page 442. The south-eastern side of the channel of approach, between Rt Oštro and Rt Kavranić (Gavranić), about half 15
a mile north-north-eastward, is divided into two bays by a projecting point forming Kraljevica harbour, on its southern side, and Carevo bay, on its northern side. The land rises steeply at Rt Kavranić, and that point is steep-to. The north-western side of the entrance channel is steep, with deep water close to; the two coves on this side 20
are not suitable for anchorage.

Bakarski zaliv lies within Rt Kavranić and Babново point, about 2 cables west-north-westward. The castle of Frankopan, on the south-eastern side of the channel, is conspicuous. Bakarski zaliv is surrounded by bold shores and has accommodation for a considerable 25
number of vessels of any size. The north-eastern slopes are covered with vineyards in terraces, and appear bare; the opposite side shows thicker vegetation and the north-western part is wooded. The Bora blows without warning and with violent squalls from any direction; the Scirocco causes a considerable sea in the north-western part. 30

The bay and village of Bakarac are situated at the south-eastern end of Bakarski zaliv, and Luka Bakar at the north-western end.

The bottom of Bakarski zaliv is muddy, but because of the strong winds anchorage is not safe and, consequently, it is advisable to secure 35
to the shore.

Lights.—The light on Rt Oštro is described on page 442.

A light is exhibited, at an elevation of 49 feet (14^m9), from a red circular iron tower, 16 feet (4^m9) in height, on Rt Kavranić (*Lat.* 45° 17' N., *Long.* 14° 34' E.).

Kraljevica harbour.—**Lights.**—Kraljevica harbour is sheltered 40
from all but westerly winds, which may cause a considerable sea; the bottom is mud and good holding ground. Almost the whole harbour is bordered by a masonry quay, and on the north-eastern side, westward of the health office, there is a square landing mole. A shoal, with a depth of less than 6 feet (1^m8) over it, lies close southward of this 45
mole.

Two lights are exhibited, each at an elevation of 13 feet (4^m0), from an iron column, 9 feet (2^m7) in height, one situated on the north-eastern corner, and the other on the south-western corner of the landing mole. 50

There is a mooring buoy in the middle of the harbour, south-westward of the landing mole.

Floating dock.—There are a floating dock and two slipways in Kraljevica harbour. See Appendix I, page 601.

Charts 2711, 1440, 2158a.

Chart 2711, plan of Bakar bay.

Anchorage.—Vessels can anchor in the middle of the harbour ; two anchors should be used and hawsers laid out astern.

Anchorage is prohibited southward of an imaginary line drawn from the harbour office, situated on the mole, to the fourth bollard from westward along the south-western side of the harbour, in order not to foul the moorings of the floating dock and mooring buoy.

The quays are provided with bollards and rings ; they slope outwards underwater, but there is sufficient depth for a vessel of medium size about 60 feet (18^m3) off them. The only wharf where vessels may berth alongside is that on the northern side of the landing mole, where a vessel, drawing not more than 10 feet (3^m0) can lie.

Town.—The town of Kraljevica, which contained 2,120 inhabitants, in 1931, is situated on the eastern side of the harbour. Fresh provisions can be obtained.

Bakarac bay.—**Light.**—**Anchorage.**—At the head of Bakarac bay there is a small boat basin, protected by a mole extending a short distance north-westward and then northward. Small craft can berth along the eastern side of the outer part of this mole, off which there are depths of 11 feet (3^m4).

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, 16 feet (4^m9) in height, on the molehead.

Bakarac bay affords good shelter only in south-easterly winds.

Bakarac village contained 564 inhabitants, in 1930.

Luka Bakar.—**Quays.**—Luka Bakar is roomy, with good holding ground of mud. There are quays along both sides of the harbour ; close alongside the quays on the north-eastern side, the depths are small, increasing rapidly a short distance off. The Harbour master's office is situated on the north-eastern side about 1½ cables from the head of the harbour ; a short mole, with a light-column on it, projects from the quay near this office.

Obala Primorje, about 440 yards (402^m3) long, with depths of from one to 13 feet (0^m3 to 4^m0) alongside, lies between the mole just mentioned and the head of the harbour.

Obala Podbok, about 490 yards (448^m4) long, with depths of from 6 to 26 feet (1^m8 to 7^m9) alongside, lies with its north-western end about 2¼ cables south-eastward of the mole. This quay is connected to the railway system.

A factory quay, about 87 yards (79^m6) long, with depths of from 16 to 24 feet (4^m9 to 7^m3) alongside, lies on the south-western side of the harbour, about half a mile south-south-eastward of the mole.

Obala Goranin, about 87 yards (79^m6) long, with depths of from 13 to 20 feet (4^m0 to 6^m1) alongside, lies close north-westward of the factory quay. There are some rocks, with a least depth of 14 feet (4^m3) over them, close northward of this quay, which make caution necessary when proceeding alongside.

There is a small boat harbour on the western side of the head of the harbour.

There are several mooring buoys in the harbour.

Light.—A light is exhibited, at an elevation of 13 feet (4^m0), from an iron column, 8 feet (2^m4) in height, on the head of the mole in front of the Harbour master's office (*Lat.* 45° 18' N., *Long.* 14° 32' E.).

Anchorage.—There is temporary anchorage, in fine weather, about

Charts 1440, 2158a.

Chart. 2711, plan of Bakar bay.

1½ cables south-south-eastward of the light-column, in depths of from 12 to 15 fathoms (21^m9 to 27^m4).

Vessels can also secure, head and stern, in the middle of the harbour between the quays; there are a number of bollards for this purpose. 5

Town.—The town of Bakar lies at the head of the harbour and contained 2,074 inhabitants, in 1931. The town is connected to the railway system, and is a port of call for local steamers.

Fresh provisions can be obtained.

Chart 1996.

Sušak.—**General remarks.**—The Port of Sušak is divided into three parts, Brajdica, on the eastern side of the mouth of Rečina river; Sušačka luka (Baross basin), situated westward of the mouth of Rečina river; and Mrtvi kanal, which extends 3 cables north-eastward from the eastern end of Sušačka luka. 10

Quays.—Brajdica consists of a quay, about 226 yards (206^m6) long, with depths of from 23 to 26 feet (7^m0 to 7^m9) alongside. At the western end of the quay and close eastward of the mouth of Rečina river, two short piers, about 44 yards (40^m2) apart, project in a south-south-westerly direction; there are depths of about 13 feet (4^m0) 15 alongside the western side of the eastern of these piers. There is a mooring buoy off Brajdica quay. 20

Sušačka luka is protected southward by Aleksandrov gat, about 1½ cables long, with two short arms projecting from its western end, one west-south-westward and the other northward; opposite the 25 latter, a mole projects from the southern side of Porto di Fiume, leaving an entrance to the harbour about 55 yards (50^m3) wide. Within the entrance, on the northern side, there is an opening, crossed by a swing bridge, into Porto di Fiume. Karadordeva obala forms the northern side of the harbour eastward of this opening, and Aleksandrov 30 gat, the southern side. Obala Frana Supila is situated at the eastern end of the harbour; Barčičev gat extends half a cable west-north-westward from the southern end of this quay, leaving a small area between it and Aleksandrov gat. The quays within the harbour have depths of from 23 to 32 feet (7^m0 to 9^m8) alongside and are connected 35 to the railway system.

Mrtvi kanal is entered through an opening, crossed by a swing bridge, in the north-eastern corner of Sušačka luka. The permission of the harbour master must be obtained before this bridge is opened. About a cable north-eastward of the entrance there is a second swing 40 bridge which is generally open. There are depths of from 13 to 16 feet (4^m0 to 4^m9) alongside the quay on the south-eastern side of this channel, except at its north-eastern end where it is shallow. Merchant vessels can remain in Mrtvi kanal for three days only.

Lights.—A light is exhibited, at an elevation of 52 feet (15^m8), 45 from a white iron column with black bands, surmounted by a white ball, 54 feet (16^m5) in height, on the head of the arm extending west-south-westward from Aleksandrov gat (*Lat. 45° 19' N., Long. 14° 26' E.*).

Two lights are exhibited, each at an elevation of 18 feet (5^m5) and from an iron column, 10 feet (3^m0) in height, situated one on each pier- 50 head near the mouth of Rečina river.

Two lights are exhibited, each at an elevation of 17 feet (5^m2) and from an iron column, 10 feet (3^m0) in height, one on either side of the entrance to Sušačka luka.

Charts 1440, 2158a.

Chart 1996.

Anchorage.—Vessels can anchor off the piers at the mouth of Rečina river. There are landing steps at the eastern pier.

A heavy sea is caused by southerly winds when they blow directly through Krčki kanal.

Prohibited anchorage.—Anchorage is prohibited in an area, indicated on the chart, close westward of Sušačka luka.

Port regulations.—A vessel entering or leaving Sušačka luka must proceed at slow speed; the vessel entering must wait outside until the vessel leaving is clear.

Town.—**Port facilities.**—The town of Sušak, which contained 16,100 inhabitants, in 1931, is situated eastward of Rečina river; it is connected to the railway system. There is a hospital in the town.

There is regular steamer communication with foreign countries and the principal ports in Yugoslavia.

A small quantity of coal is kept in stock. Water is laid on to the quays. Fresh provisions can be obtained.

Vessels of 10,000 tons and 500 feet (152^m4) long can be accommodated. Small repairs can be executed.

Aleksandrov gat and Barčičev gat are furnished with cranes with a capacity of 3½ tons.

Porto di Fiume.—Porto di Fiume is formed by Molo Ammiraglio Cagni, which extends from the eastern end of the town in a general west-north-westerly direction and encloses an area, the bottom of which consists of mud. Within the port, six moles extend south-south-westward from the northern shore. The channel between Molo I (formerly Palermo), the westernmost of these moles and Molo Ammiraglio Cagni is about 1½ cables wide. There are several mooring and warping buoys in the harbour. There is ample quayage with depths of from 21 to 30 feet (6^m4 to 9^m1) alongside. The port is accessible to vessels up to 656 feet (200^m0) in length.

Approaching Fiume from southward, Veli Vrh (chart 2711), 1,412 feet (430^m4) high, about 2 miles northward of the town, is a good distant mark. On a nearer approach the following objects are conspicuous: the castle of Trsat, about half a mile north-eastward of the town; the civil hospital (*Lat. 45° 20' N., Long. 14° 26' E.*), 4½ cables north-eastward of the western extremity of Molo Ammiraglio Cagni; the tanks at the petroleum basin; and a crane at Porto Bergudi. The principal light-tower is not conspicuous.

About 1½ cables westward of Molo I there is a small boat harbour, with a narrow entrance facing westward; alongside the quays within this harbour there are depths of from 2½ to 3 fathoms (4^m1 to 5^m5).

Between this boat harbour and the petroleum basin, about 2 cables west-north-westward, there is a quay with depths of about 11 fathoms (20^m1) alongside its eastern half, whence the depths gradually decrease to less than 2½ fathoms (5^m0) near the petroleum basin.

The petroleum basin is formed by a right-angled mole with the entrance on the western side. Within the basin, a 3-fathom (5^m5) patch lies about three-quarters of a cable east-north-eastward of the western extremity of the southern mole. From six to eight large vessels can be accommodated in the basin; there are depths of from 22 to 26 feet (6^m7 to 7^m9) alongside the northern quay.

Torpedo works are situated from 3 to 5 cables westward of the

Charts 2711, 1440, 2158a.

Chart 1996.

petroleum basin. There is a boat harbour formed by two moles, with the entrance at the western side, at these works. A mooring buoy is situated about $1\frac{1}{2}$ cables west-south-westward of the head of the southern mole of the boat harbour.

Porto Bergudi, about 2 cables westward of the torpedo works, is formed by a mole projecting about $2\frac{1}{2}$ cables west-south-westward, with a pier northward of it, projecting in the same direction; there is a dockyard close north-westward of the harbour, which can be distinguished by its large buildings. Alongside a length of about 300 feet (91^m4), on the inner side of the outer mole, there are depths of 26 feet (7^m9). A floating dock is moored a short distance within this port.

Porticciolo Cantrida lies close westward of the dockyard, previously mentioned, and is protected by a short mole extending westward. The eastern side of the harbour is quayed. Small vessels, drawing 15 11 feet (3^m4), or less, can berth along the inner side of the mole.

Lights.—A light is exhibited, at an elevation of 127 feet (38^m7), from a white concrete tower, on a two storied building, 126 feet (38^m4) in height, situated about $1\frac{1}{2}$ cables inland, at the western end of the town of Fiume.

A light is exhibited, at an elevation of 49 feet (14^m9), from a post, on a concrete house, on the head of Molo Ammiraglio Cagni (*Lat.* 45° 20' N., *Long.* 14° 25' E.).

A light is exhibited, at an elevation of 26 feet (7^m9), from a column, on an iron tower, 16 feet (4^m9) in height, on the head of Molo I.

A light is exhibited, at an elevation of 29 feet (8^m8), from a white square column, on a concrete hut, 23 feet (7^m0) in height, on the southern molehead of the petroleum basin.

A light is exhibited, at an elevation of 29 feet (8^m8), from a white square column, on a concrete hut, 23 feet (7^m0) in height, on the head of the western mole in the petroleum basin.

A light is exhibited, at an elevation of 31 feet (9^m4), from a white square column, on a concrete hut, 23 feet (7^m0) in height, on the head of the southern mole at Porto Bergudi (*Lat.* 45° 20' N., *Long.* 14° 24' E.).

Pilotage.—Pilotage is not compulsory for merchant vessels. Pilots, when their services are employed, confine themselves to indicating to the master of the vessel the place assigned for anchorage.

Anchorage.—**Directions.**—There are no dangers in the approach to Fiume. A vessel should not enter the port at night without a pilot, but should bring up in the road. Large vessels should anchor off the port, mud, good holding ground, at a distance of about three-quarters of a mile offshore. Vessels can also anchor outside the harbour, in depths of less than 27 fathoms (49^m4), mud, at a short distance offshore; they should be careful not to obstruct the entrance to the main harbour or those of the various basins. With strong southerly winds, vessels at anchor should always be ready to leave.

Although the fetch in Golfo di Fiume is not more than 10 or 11 miles in any direction, a heavy sea is sent in by southerly winds when they blow directly through Krčki kanal.

Prohibited Anchorage.—**Submarine cable.**—Anchorage is prohibited in an area, indicated on the chart, southward of the eastern end of Molo Ammiraglio Cagni.

A submarine cable extends southward across the harbour from the

Chart 1996.

head of Molo III (formerly Genova), situated about half a mile eastward of the head of Molo Ammiraglio Cagni.

Regulations.—A vessel entering Porto di Fiume must proceed at 5 slow speed and keep on the starboard side of the fairway.

Entrance to the petroleum basin is only permitted by day and to such vessels as have petroleum to load or discharge. Before entering, the boiler and galley fires must be extinguished; smoking is forbidden and safety lamps are provided for the interior lighting of vessels.

10 **Aircraft signals.**—A black ball displayed at the peak of the mast and a prolonged blast sounded on the siren at Molo III, situated $4\frac{1}{2}$ cables east-south-eastward of Molo I, indicate the arrival, departure or movement of aircraft. A vessel should not enter or leave the port till after the arrival or departure of the aircraft thus 15 signalled.

Town.—The town of Fiume, called Rijeka by the Yugoslavs, is one of the most important commercial towns in the Adriatic. It extends about 2 miles along the shore of Golfo di Fiume, its sea-face is bordered by quays, and it contains several imposing buildings; 20 it is backed by high land. The population, in 1940, was about 53,401.

Communications.—Fiume is connected to the general railway system of Europe, the railway station being close to the port, with sidings to the various quays.

25 There is frequent steamer communication with other ports in the Adriatic and with all parts of the world.

There is an air service with Abbazia, Brioni and Venice.

There is a radio station, *see* page 46.

Trade.—Shipping.—There are cement, chemical, soap and other 30 factories.

The principal imports are coal, phosphates, pyrites, mineral oils, cotton, metals, machinery, stone &c.; the exports are timber, fertilisers, refined mineral oils, machinery, wine, grain, cattle, &c.

In 1938, 5,941 vessels, aggregating 2,277,000 tons, entered the port.

35 **Port facilities.**—A moderate quantity of coal is usually in stock which can be supplied at the rate of about 48 tons an hour.

Fresh provisions are plentiful.

Water is laid on to the quays.

In Porto Bergudi (*Lat.* $45^{\circ} 20' N.$, *Long.* $14^{\circ} 24' E.$), there is a crane 40 with a capacity of 6 tons. The quays are furnished with cranes, with capacities varying from $1\frac{1}{2}$ to 3 tons, and there is a 10-ton crane on Molo IV (formerly Ancona).

Tugs and lighters are available. One tug is fitted with salvage equipment.

45 Repairs can be carried out.

There is a floating dock in the privately owned dockyard in Porto Bergudi; for details, *see* Appendix I, page 601. There is a small patent slip in the boat harbour, a short distance westward of Molo I.

Deratisation can be carried out.

50 There is a civil hospital with 800 beds.

Chart 2711.

Western side of Golfo di Fiume.—On its western side, Golfo di Fiume is entered through Canale della Faresina, page 439.

Between Valle Santa Marina, situated about $3\frac{1}{4}$ miles northward of

Charts 2711, 1440, 2158a.

Chart 2711.

Punta Sip, the coast presents a less desolate appearance than it does farther southward. A few villages and patches of cultivation are visible, especially on the slope of Monte Maggiore, page 422, and in the neighbourhood of Fiume. The coast is almost everywhere high, 5 abrupt, bordered by deep water and without any shelter, except a few little boat creeks protected by moles, and the small harbours of Ica, Abbazia, Volosca and Preluca, all situated within $3\frac{1}{2}$ miles of the head of the gulf.

Valle Santa Marina affords temporary anchorage to small craft in 10 fine weather.

Punta della Madonna, with Scogli Lucica, above water, close southward of it, projects from the coast about a mile northward of Valle Santa Marina. Between Punta Cesaro (Medvea), about a mile northward of Punta della Madonna, and Punta Medea (Tanaglie), a quarter 15 of a mile farther northward, is the entrance to a conspicuous valley, through which a torrent flows. A conspicuous yellow house with turrets and a red roof stands on Punta Cesaro.

Punta Laurana, where there is a boat basin, a pier for the local steamer, and, on its southern side, a stone mole, lies about $1\frac{1}{4}$ miles 20 northward of Punta Medea. The southern side of Punta Laurana is bordered by a bank, with a depth of $2\frac{1}{2}$ fathoms (5^m0) over it. It is not advisable to anchor off the point, as this anchorage is exposed to easterly and south-easterly winds which raise a high sea. The village of Laurana, which contained about 1,272 inhabitants, in 1940, lies 25 westward of the point. Fresh provisions can be obtained.

Valle Ica is situated about a mile northward of Laurana; here there is a small landing pier, with a depth of 3 fathoms (5^m5) at its head. A cylindrical mooring buoy, painted white and red, is moored a short distance south-eastward of the pierhead; small vessels 30 can secure to this buoy. Vessels can anchor, in fine weather, off the cove, over a bottom of sand and mud, good holding ground, but should not anchor between the mooring buoy and the south-western side of the cove, as there is a funnel-shaped hole with a depth of about 18 fathoms (32^m9) or probably greater depth, in which vessels are liable 35 to foul their anchors. Small coasting vessels are built at Ica (*Lat. $45^{\circ} 18' N.$, Long. $14^{\circ} 17' E.$*).

The village of Ici lies about three-quarters of a mile northward of Valle Ica.

Abbazia, a health resort which contained about 5,605 inhabitants, 40 in 1940, lies about $2\frac{1}{4}$ miles north-north-eastward of Valle Ica; it has a small mole projecting north-eastward, on the inner side of which small vessels, drawing less than 11 feet (3^m4), can secure. About 3 cables south-south-westward, the shore bank, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over it, and on which there are some sunken rocks, is 45 about $1\frac{1}{2}$ cables wide.

Large vessels can anchor half a mile eastward of the mole at Abbazia, in a depth of 26 fathoms (47^m5), good holding ground; smaller vessels can anchor farther in.

Local steamers call at Abbazia.

50

Provisions can be obtained.

An area extending for a distance of about $1\frac{1}{2}$ cables off the coast in the vicinity of Abbazia, is reserved for the use of aircraft. In order to signal the arrival, departure or exercising of aircraft, three short

Charts 1440, 2158a.

Chart 2711.

blasts, followed by a prolonged blast, will be sounded from the siren on the mole at Abbazia. All craft capable of manœuvring must leave a clear passage for the aircraft.

- 5 Volosca, a town which contained about 2,700 inhabitants, in 1940, lies about three-quarters of a mile north-north-eastward of Abbazia. The harbour, with a depth of about 10 feet (3^m0) in it, is formed by two short moles, the southern one extending north-eastward, and the northern extending eastward, from the shore. Westward of the south-
 10 ern mole there is a shallow boat harbour. A vessel should not remain at anchor outside the moles, as south-easterly and easterly winds raise a sea.

- Valle Preluca, half a mile north-eastward of Volosca, is easily distinguished by its position at the head of Golfo di Fiume and by the
 15 town of Kastav, about 1½ miles inland, near which there is a white castle on a hill. A rock, with a depth of less than 6 feet (1^m8) over it, lies near the eastern entrance point. There is anchorage for large vessels in the eastern part of the bay, in depths of from 16 to 21 fathoms (29^m3 to 38^m4), fairly sheltered. The Bora and easterly winds are felt
 20 strongly, and, as the bay is open southward, the Scirocco raises a high sea. There are three wooden stages and several mooring buoys for the use of small craft employed in transporting stone material obtained from the eastern side of the bay.

- From June to October, tunny nets, varying in length from about
 25 500 to 650 feet (152^m4 to 198^m1), are laid off Valle Preluca. See page 49.

Lights.—A light is exhibited, at an elevation of 20 feet (6^m1), from a black iron column, 17 feet (5^m2) in height, on the south-eastern angle of the quay at Valle Santa Marina.

- 30 A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron column, 19 feet (5^m8) in height, on the pier-head at Laurana (*Lat.* 45° 17' N., *Long.* 14° 17' E.).

- A light is exhibited, at an elevation of 23 feet (7^m0), from a black iron column, 19 feet (5^m8) in height, on the head of the southern mole
 35 at Laurana.

A light is exhibited, at an elevation of 23 feet (7^m0), from a black iron column, 19 feet (5^m8) in height, on the pierhead on the northern side of Valle Ica.

- A light is exhibited, at an elevation of 25 feet (7^m6), from a red iron
 40 column on a circular hut, 22 feet (6^m7) in height, on the molehead at Abbazia.

A light is exhibited, at an elevation of 18 feet (5^m5), from an iron tower, 18 feet (5^m5) in height, on the southern molehead at Volosca.

- A light is exhibited, at an elevation of 21 feet (6^m4), from a black
 45 iron column, 18 feet (5^m5) in height, on the northern molehead at Volosca.

Charts 1440, 2158a.

CHAPTER IX

COAST OF ITALY FROM CAPO MERLERA TO PUNTA DEL TAGLIAMENTO

Chart 2711.

BAIA DI MEDOLINO.—This bay is entered between Capo Merlera (*Lat. 44° 48' N., Long. 14° 00' E.*) and Capo Promontore, about 4 miles south-westward, and affords some well sheltered anchorages. It is divided into two basins by the low peninsula which projects southward from the north-eastern side of the bay and terminates at Punta Castello, about 3 miles westward of Capo Merlera. The Health office, off which there is a small mole, is situated on the western side of this peninsula, about a quarter of a mile north-north-westward of Punta Castello. The northern basin is shallow and only available for small craft. The shores of the bay are indented and bordered by shallow banks; within the bay, there are several islets and rocks which are also bordered by banks.

Val Rosso is situated on the western side of the bay, about three-quarters of a mile north-north-westward of Capo Promontore. The channel, in which there are depths of less than 5 fathoms (9^m1), leading into the northern basin is entered between Punta Castello and Punta Munat, about 2 cables westward; the village of Promontore is situated about half a mile west-south-westward of the latter point. Valle Ronzi, where there are two small moles, lies on the western side of the northern basin, about half a mile north-north-westward of Punta Castello. Valle di Medolino lies on the eastern side, about three-quarters of a mile northward of Punta Castello, with the village of Medolino at a short distance north-eastward of its head; this village contained about 1,157 inhabitants, in 1940. Valle Pomèr, with the village of the same name at its head, lies at the north-western end of the inner basin.

Islets and dangers.—Isolotti Lievele Grande and Lievele Piccolo, 43 and 8 feet (13^m1 and 2^m4) high, respectively, lie about a mile south-westward of Capo Merlera. There is a depth of 3½ fathoms (6^m4) between the banks extending from them, but between Isolotto Lievele Grande and the coast is a shallow flat. A rocky patch, with a depth of 5 fathoms (9^m1) over it, lies about 2 cables southward of Isolotto Lievele Piccolo; Capo Merlera light is not visible over this patch. A shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 2½ miles south-south-westward of Capo Merlera lighthouse. Isolotto Santa

Charts 201, 1440, 2158a.

Chart 2711.

Marina, 23 feet (7^m0) high and bare, lies about 2½ miles west-south-westward of Capo Merlera, near the end of a shallow spit extending about a mile off the northern shore of the bay; depths of less than 5 fathoms (9^m1) extend about half a mile south-eastward of this islet.

Isolotto Fenera, which has two peaks, the southern of which is 23 feet (7^m0) high, is thinly covered with grass and lies about three-quarters of a mile eastward of Capo Promontore; Secca Fenera, with a depth of 6 feet (1^m8) over it, lies 2 cables north-westward of this islet. 10 Isolotto Solcovaz lies about three-quarters of a mile west-north-westward of Isolotto Fenera and 2 cables off the southern entrance point of Val Rosso.

Isolotto Cielo, 72 feet (21^m9) high, lies about 3 cables north-eastward of Isolotto Solcovaz and half a mile offshore; Secca Cavallo, with 15 depths of less than 6 feet (1^m8) over it, rock, lies from half a cable to 3 cables south-south-eastward of Isolotto Cielo. In the fairway of the narrow passage between Secca Fenera and Secca Cavallo there is a least depth of 5½ fathoms (10^m1). Secca Cielo, with a depth of one foot (0^m3) over it, lies about a cable south-westward of Isolotto 20 Cielo.

Isolotto Trombolo, bare and rugged, lies about half a mile north-westward of Isolotto Cielo and a quarter of a mile off the coast farther north-westward, to which it is connected by a bank, with depths of less than 5 fathoms (9^m1) over it. Secca Gaidarussa, with a depth of 25 less than 6 feet (1^m8) over it, lies about a quarter of a mile south-westward of Isolotto Trombolo, near the end of a spit which extends about a quarter of a mile north-eastward from the coast.

Isolotto Pomèr lies in the northern basin, about a quarter of a mile eastward of the south-western entrance point of Valle Pomèr. Isolotto 30 Zuccon lies about 3½ cables north-north-eastward of Isolotto Pomèr and close offshore.

Light.—Beacons.—The lights on Capo Merlera, Scoglio Porèr and Secca Pericolosa are described on pages 422, 455 and 454, respectively.

35 A light is exhibited, at an elevation of 29 feet (8^m8), from a red iron column, 20 feet (6^m1) in height, on Punta Munat (*Lat.* 44° 48' N., *Long.* 13° 55' E.).

Secca Fenera is marked, on its north-western side, by a beacon, consisting of an iron staff surmounted by two crossed framework discs 40 and a vane, painted red and 23 feet (7^m0) high.

Secca Cavallo is marked, on its eastern side, by a similar beacon, painted white and 20 feet (6^m1) high.

Secca Cielo is marked, on its south-western side, by a similar beacon, painted in red and white bands and 19 feet (5^m8) high.

45 Secca Gaidarussa is marked, on its north-western side, by a similar beacon, painted in black and white bands and 18 feet (5^m5) high.

A square white pyramid, 10 feet (3^m0) in height, is situated, at an elevation of 18 feet (5^m5), on Punta Castello.

Anchorage.—The Bora blows strongly here, and, in consequence, 50 this bay is seldom used by large vessels. The best anchorage, protected by Isolotto Cielo from south-easterly wind and sea, is, in a depth of 9 fathoms (16^m5), mud, good holding ground, between Isolotti Cielo and Trombolo. Small vessels can also anchor south-westward of the Health office, in a depth of 6 fathoms (11^m0), mud, with a

Chart 2711.

hawser ashore north-eastward in case of necessity. The sea caused by south-easterly winds is much diminished before reaching the Health office.

Val Rosso affords shelter to small vessels, with local knowledge, in depths of from 2 to $3\frac{1}{2}$ fathoms (3^m7 to 6^m9), mud, protected by the islets and shoals lying in the approach to the cove.

Valle di Medolino is only suitable for boats.

Valle Ronzi and Valle Pomèr are only suitable for small vessels with local knowledge.

Directions.—There are three channels to the anchorages in Baia di Medolino. The first, which is usually preferred by vessels bound to Val Rosso, is between Capo Promontore and Isolotto Fenèra. Mid-channel should be preserved by steering for Isolotto Cielo, and, when abreast the northern end of Isolotto Fenèra, a vessel should steer for Isolotto Solcovaz and take the channel between Isolotto Solcovaz and the coast or the one north-eastward of that islet, but keeping it close aboard.

To proceed to the anchorage between Isolotti Cielo and Trombolo, the passage between Isolotti Santa Marina and Cielo is generally taken, and the anchor dropped northward of the latter. This channel lies in the *white* sector of Punta Munat light, between bearings of from 312° to 327° , and should also be used by a vessel bound for the anchorages in the northern basin, but caution is necessary as depths of less than 5 fathoms (9^m1) extend a short distance into the sector from both sides. A large vessel should not approach the eastern side of Isolotto Fenèra within a distance of $2\frac{1}{2}$ cables.

If the channel leading to Val Rosso is taken, with the intention of proceeding farther up the bay, a vessel should pass close eastward of Isolotto Solcovaz and bring the Health office in line with the eastern end of Isolotto Trombolo, which leads between the beacon marking Secca Cielo and that marking Secca Gaidarussa, and towards the anchorage; then she should pass between Isolotti Trombolo and Cielo, and proceed up the bay as before.

There is also a channel between Isolotto Santa Marina and the northern shore, suitable only for very small vessels; to clear the shoals on either side, a vessel should keep southward of mid-channel, where there is a depth of 2 fathoms (3^m7) on the shallow flat connecting the islet to the mainland.

Chart 201.

COAST.—**General remarks.**—The western and northern coasts of Istria extend about 65 miles from Capo Promontore to southward of Trieste, forming numerous indentations, among which are some excellent harbours, the largest being on the northern coast between Capo Salvore and Trieste; the safest are on the western coast, and almost every village may be said to have its little harbour. The coast between Capo Promontore and Capo Salvore is bordered by numerous rocks and shoals, which in places extend for a distance of over 2 miles offshore. The depths near the coast vary greatly; near the coast between Capo Promontore and Rovigno there are frequently depths of 20 fathoms (36^m6), mud, close inshore; between Rovigno and Capo Salvore (*Lat.* $45^\circ 30' N.$, *Long.* $13^\circ 30' E.$) the depth, outside the rocks, is about 13 fathoms (23^m8), mud.

Charts 2711, 1440, 2158a.

Chart 201.

Istria is a mountainous peninsula. It produces oil, wine, wheat, honey, beeswax, silk, hides, tallow, timber and salt, and possesses marble and freestone quarries. The chief occupation is agriculture.

5 The numerous small ports on this coast are nearly all in daily communication by steamer with each other and with Trieste and Fiume.

Anchorage.—There is anchorage all along this part of the coast of Istria, but regard must be had to the direction of the prevailing winds. Generally a vessel may safely anchor during north-easterly
10 and south-easterly winds, within a zone of from 3 to 10 miles offshore, in good holding ground. In the Bora, if it can be avoided, a sailing vessel should never anchor between Capo Salvore and Trieste, and it is not safe to bring up anywhere with onshore winds unless there is every indication of fine weather; and then preparations should be
15 made for leaving at any moment.

Charts 201, 2711.

Coast.—Capo Promontore (*Lat. 44° 46' N., Long. 13° 56' E.*), the southern extremity of Istria, is a low narrow hilly projection, difficult to define when the atmosphere is not very clear. Scoglio Porèr and
20 several other dangers lie off this cape, and the currents are often rapid with strong eddies in its vicinity, caused by streams setting out of Il Quarnaro.

It is customary for vessels bound to Venice or its neighbourhood to sight Capo Promontore; on approaching it from eastward, in clear
25 weather, the belfries of the churches in the villages of Sissano, Lisignano, Medolino and Promontore may be seen on the hills in succession, together with the lighthouses on Scoglio Porèr and Secca Pericolosa; when approaching from westward, the village of Promontore only, with the lighthouses before mentioned, are visible.

30 **Off-lying rocks and dangers.—Beacons.**—Secca Pericolosa, a rock, with a depth of 9 feet (2^m7) over it, lies about 2 miles south-westward of Capo Promontore. There is a depth of 5½ fathoms (10^m1) close southward of this rock; its western side is steep-to. A rocky shoal, with a depth of 5 fathoms (9^m1) over it and steep-to, lies
35 about a mile north-north-westward of Secca Pericolosa.

Scoglio Porèr, 23 feet (7^m0) high, lies about 1½ miles north-north-westward of Secca Pericolosa light-tower and near the outer end of a reef, with depths of less than 5 fathoms (9^m1) over it, which extends
40 about 1½ miles south-westward from Punta Chersine, the western extremity of Capo Promontore. A shoal, with a depth of 2¾ fathoms (5^m0) over it, lies on the south-eastern side of the reef, about 2¾ cables east-south-eastward of Scoglio Porèr; Secca Porèr and Secca Fèlonega, each with a depth of less than 6 feet (1^m8) over it, lie, the former at a distance of 4 cables east-north-eastward, and the latter at a distance
45 of about 4½ cables north-eastward of Scoglio Porèr, Isolotto Fèlonega lies on the north-western end of the reef, close off Punta Chersine. Secca Chersine, with a depth of one foot (0^m3) over it, lies about 2 cables eastward of Isolotto Fèlonega and one cable offshore.

Secca Porèr and Secca Chersine are each marked by a pole beacon,
50 surmounted by a sphere, painted white; Secca Fèlonega is marked by a similar beacon, painted red. These beacons are liable to be washed away.

Lights.—Fog signal.—Signal station.—A light is exhibited, at an elevation of 48 feet (14^m6), from a circular concrete tower on a

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Chart 201, 2711.

conical base, 61 feet (18^m6) in height, on Secca Pericolosa (*Lat. 44° 44' N., Long. 13° 54' E.*).

A light is exhibited, at an elevation of 115 feet (35^m0), from a white circular stone tower on a dwelling, 103 feet (31^m4) in height, on Scoglio Porèr. Distress signals are made from this lighthouse.

An air fog signal is sounded from Scoglio Porèr lighthouse.

A signal station, painted in black and white bands, is situated on Scoglio Porèr and communication can be made by the International Code of Signals. This station is connected to the telegraph system and is in telephonic communication with Pola, Fasana and Brioni.

A light is exhibited, when Secca Pericolosa light is extinguished, at an elevation of 39 feet (11^m9), from the signal platform at the southern extremity of Scoglio Porèr.

Chart 201.

Coast.—Between Punta Chersine and Capo Brancorso, about 7 miles north-westward, the coast is uncultivated, wooded in places, and gradually increases in height. There are several small bays which afford shelter with offshore winds.

Monte Cope, 190 feet (57^m9) high, situated 3 miles north-north-westward of Punta Chersine, separates Porto Olmo Grande from Porto Olmo Piccolo. The former, which is the northern of the two, is a narrow inlet affording shelter from all except south-westerly winds to small vessels, in a depth of 2 fathoms (3^m7), mud, good holding ground; on the southern side of this port there is a small mole with a depth of about 13 feet (4^m0) at its head. Porto Olmo Piccolo is more exposed and suitable only for boats.

Chart 202, plan of Port Veruda.

Porto Veruda, situated 4½ miles north-westward of Punta Chersine, consists of two narrow inlets bordered by hills, and is only suitable for small vessels. Capo Promontore assists to indicate its position to vessels approaching from southward, and Capo Brancorso, with Capo Compare, about a mile farther northward, to those from northward. At night, the light on Punta Verudella shows the entrance. Isolotto Veruda, 66 feet (20^m1) high, lies at the entrance of the two inlets forming the harbour, and may be distinguished by a ruin on its southern peak, 62 feet (18^m9) high. Isolotti Frascchèr Grande and Frascchèr Piccolo are situated just southward of this islet and the three islets are connected to the coast by foul ground. The entrance to Porto Veruda is between Isolotto Veruda and Punta Verudella, on the mainland, about 3 cables west-north-westward; a bank extends three-quarters of a cable southward of this point, which should not be approached nearer than a cable. The passage, in the fairway of which there is a depth of about 2½ fathoms (5^m0), round the northern end and



Scoglio Porèr lighthouse.

Chart 202, plan of Port Veruda.

eastern side of Isolotto Veruda (*Lat. 44° 50' N., Long. 13° 50' E.*) to Val Cacoia, the southern inlet, is narrow. The northern inlet is easier of access and to be preferred; here small vessels can find anchorage, sheltered from all winds, in a depth of about 6 fathoms (11^m0), hard mud, about 1½ cables southward of the Health office, with Monte Volaria (Gallie), 138 feet (42^m1) high, about 4 cables east-north-eastward of the Health office, bearing about 062°. Close northward of this anchorage, the depths decrease to 6 feet (1^m8) and less. There are three small moles on the western side of this inlet, the northernmost being abreast the Health office.

A vessel prevented by contrary winds from entering Porto Veruda, may anchor, in depths of from 20 to 23 fathoms (36^m6 to 42^m1), mud, between Isolotto Veruda and Punta San Giovanni, which is situated 3 cables north-westward of Punta Verudella.

Val Sentenera, situated eastward of Isolotto Frascchèr Grande, affords anchorage for small vessels in depths of from 5 to 9 fathoms (9^m1 to 16^m5); it is open southward.

Light.—A light is exhibited, at an elevation of 34 feet (10^m4), from a turret on the corner of a white house, 26 feet (7^m9) in height, on Punta Verudella.

Chart 202.

Anchorage.—In case of necessity during a Bora, a vessel may anchor about 9 cables west-north-westward of Capo Brancorso, with Capo Compare, bearing 040°, in a depth of 22 fathoms (40^m2).

Chart 201.

Measured distance.—Beacons.—Beacons are erected on the coast between Capo Promontore and Capo Compare for marking a measured distance of 4 miles. The south-eastern beacons are on the south-eastern slope of Monte Cope and the north-western beacons are near Capo Brancorso; each pair of these beacons, in line, bear 027°. Other beacons divide the distance into one mile sections, the second section from south-eastward being further divided into half miles.

The line of direction on which to run the measured distance, 296° and 116°, is indicated by two beacons erected on Capo Promontore, close northward of Punta Chersine; the front beacon on the cape is surmounted by a staff, and the rear beacon by a staff and ball.

Chart 202.

Coast.—Telegraph cable.—Beacon.—Between Punta San Giovanni and Capo Brancorso, about 2 miles north-westward, there is a bight, the shores of which are indented.

A submarine cable, indicated on the chart, is landed in Valle Saline, situated about a mile northward of Punta San Giovanni. The shore end of this cable is marked by a beacon. Anchorage is prohibited in the cove.

PORTO DI POLA.—This port is an Italian naval station and is an almost landlocked basin, with room for a large number of vessels of any size; it is surrounded by hills; the Bora is seldom felt with much force. The entrance, open north-westward, lies between a breakwater extending about three-quarters of a mile north-north-westward from Capo Compare (*Lat. 44° 53' N., Long. 13° 48' E.*), which is rather high and steep, and Punta Cristo, about 2½ cables north-eastward. The breakwater was reported, in 1946, to be in a bad state of

Charts 201, 1440, 2158a.

Chart 202.

repair. About $1\frac{1}{2}$ miles within the entrance there are two islets, which divide the port into the outer and inner harbours. Isolotto Santa Caterina, the northern islet, is low and has a seaplane station on it. Isolotto Sant' Andrea, the southern islet, is the larger and is 72 feet (21^m9) high, partly wooded and fortified. These islets lie on a bank, with depths of less than 5 fathoms (9^m1) over it, which extends about half a mile offshore in a south-south-easterly direction. Penisola di San Pietro, which extends from the southern shore, southward of these islets, is low and fortified. Extensive fortifications crown the heights around the port and numerous forts and batteries command the entrance.

Outer harbour.—The bottom of this harbour mostly consists of mud and is only rocky close inshore. On the northern side, Valle Maggiore lies on the south-eastern side of Punta Cristo and Valle Zonchi is entered between Punta Grosso, about three-quarters of a mile south-eastward of Punta Cristo, and Punta Zonchi, about 3 cables farther south-eastward. From the eastern side of the latter cove, a short distance northward of Punta Zonchi, an oil-fuelling pier, with a depth of 28 feet (8^m5) at its head, extends about half a cable west-north-westward. Another pier extends a short distance from the head of the cove. There are a number of oil tanks around the shores of this cove. Punta Monumenti lies about 3 cables east-south-eastward of Punta Zonchi and is connected to Isolotto Santa Caterina, about $1\frac{1}{2}$ cables east-south-eastward, by a causeway.

On the southern side of the harbour, Valle Figo lies between the root of the breakwater extending from Capo Compare and a breakwater extending a short distance offshore, about 2 cables eastward. Valle Fisella, at the head of which there are two short moles, lies about half a mile east-south-eastward of Capo Compare. The remains of some piers extend a short distance offshore midway between these two coves. Valle San Zeno, entered between two short moles, lies about 2 cables south-eastward of Valle Fisella. Valle Vergarola, protected by a mole extending a cable east-south-eastward from its western entrance point, lies about half a mile east-south-eastward of Valle San Zeno. All these coves are shallow and exposed to the Bora.

There are a number of mooring buoys in the outer harbour. For anchorage, *see* page 459.

Telegraph cable.—A submarine cable, indicated on the chart is laid across the outer harbour between Valle San Zeno and Punta Zonchi (*Lat.* $44^{\circ} 53' N.$, *Long.* $13^{\circ} 49' E.$).

Inner harbour.—Dockyard.—Buoys.—The inner harbour is well sheltered from all winds; it is divided into two parts by Isolotto Olivi and the bridge joining it to the town. This islet lies about 3 cables eastward of Isolotto Sant' Andrea. The southern portion of the inner harbour is reserved for the Royal Italian Navy; merchant vessels may anchor in the northern part.

The passage for large vessels into the inner harbour, about 2 cables wide, is between Isolotto Sant' Andrea and Penisola di San Pietro. The passage between Isolotti Santa Caterina and Sant' Andrea has been dredged to a depth of 23 feet (7^m0) for a width of 40 yards (36^m6) and is marked by four light-beacons. Several piers extend a short distance off the northern shore of the inner harbour between Punta Monumenti and Punta Aguzzo, about 6 cables east-north-eastward,

Chart 202.

and also off the shores of Vallelunga, situated at the northern end of the harbour. Valle San Pietro lies at the north-eastern end of the harbour. These two coves are reserved for the use of the Royal Italian

5 Navy and boats are not allowed to approach them.

The arsenal is situated on the south-eastern side of the inner harbour.

Isolotto Olivi is occupied by privately-owned workshops and buildings, and is connected to the dockyard in the town by a mole and a swing-bridge, which can be opened to admit vessels passing through
10 into the commercial harbour. Boats are not allowed to pass under this bridge.

On the islet there is a dockyard with two large, roofed building slips, two dry docks, a floating dock and a patent slip. The dockyard crane is conspicuous.

15 Secca Olivi, which is rocky, extends 2 cables east-north-eastward of Isolotto Olivi, leaving a passage, in which there is a depth of 3 fathoms (5^m5) between it and the shore bank eastward; the outer edges of Secca Olivi are marked by five buoys, each surmounted by a ball. There is a brown bathing pavilion on piles on this shoal.

20 The commercial harbour lies within and eastward of Isolotto Olivi. The Health office is situated on the eastern side of the harbour, about 4 cables east-north-eastward of the swing-bridge. Molo Fiume, with depths of from 13 to 19 feet (4^m0 to 5^m8) alongside, lies a short distance northward, and Molo San Tomaso, with depths of 13 feet (4^m0) along-
25 side, a short distance south-westward, of the Health office. The facilities of the commercial harbour were reported, in 1945, to be considerably reduced by damage.

East Gramaticopulo airport is situated close southward of the swing-bridge.

30 There are numerous mooring buoys in the inner harbour. For anchorage, *see* page 459.

Pilots.—Vessels approaching Porto di Pola can request the services of a pilot by using the prescribed signals, when not more than half a mile from the entrance.

35 **Lights.**—A light is exhibited, at an elevation of 31 feet (9^m4), from a red iron column, 18 feet (5^m5) in height, on Punta Cristo (*Lat.* 44° 53' N., *Long.* 13° 48' E.).

A light is exhibited, at an elevation of 30 feet (9^m1), from a black column on a circular hut, 15 feet (4^m6) in height, on the head of the
40 breakwater extending from Capo Compare.

A light is exhibited, at an elevation of 17 feet (5^m2), from a red iron column on a red hut, 17 feet (5^m2) in height, situated on the southern side of Isolotto Sant' Andrea.

Four lights are exhibited, each from an iron column on a concrete
45 block standing in shallow water, two off the northern side of Isolotto Sant' Andrea and two off the southern side of Isolotto Santa Caterina. These lights mark the passage between the islets.

Two lights, disposed vertically, are exhibited, at elevations of 51 and 41 feet (15^m5 and 12^m5), respectively, from an iron column on
50 a building, 49 feet (14^m9) in height, on the northern part of Penisola di San Pietro.

A light is exhibited, at an elevation of 19 feet (5^m8), from a black concrete hut, 17 feet (5^m2) in height, situated a short distance northward of the eastern side of Isolotto Olivi.

Charts 201, 1440, 2158a.

Chart 202.

A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron column on a circular hut, 20 feet (6^m1) in height, on the head of Molo Fiume.

A light is exhibited, at an elevation of 20 feet (6^m1), from a red iron column, 18 feet (5^m5) in height, on the head of Molo San Tomaso.

Lights are exhibited from the radio masts at the head of Valle San Pietro.

Signal station.—There is a signal station on Forte Musile, about three-quarters of a mile south-south-eastward of Capo Compare, which is available for naval and commercial purposes. This station will transmit, by telegraph, messages received from ships. Storm signals are made at the station, *see* page 43.

Anchorage.—A vessel anchoring in the outer harbour, must anchor not less than 328 yards (299^m9) eastward of an imaginary line joining Punta Cristo and the head of the breakwater and westward of a similar line joining Punta Monumenti and the head of the mole protecting Valle Vergarola; a vessel in this part of the harbour must keep to the fairway between imaginary lines joining the projecting points on each side of the harbour. Access to Valle Maggiore and Valle Zonchi is prohibited, and a vessel must not approach the shore within a distance of one cable between the eastern side of Valle Fisella and the remains of the piers north-westward of it.

No vessel may proceed eastward of the line joining Punta Monumenti and the head of the mole at Valle Vergarola without permission from the Captain of the Port.

The best anchorage is south-westward of Punta Monumenti, about 2½ cables offshore.

In the inner harbour, there is good anchorage everywhere. For vessels of medium tonnage, the best anchorage is west-south-westward of the railway station (*Lat.* 44° 53' N., *Long.* 13° 51' E.), about 4 cables northward of the Health office. Small craft can secure alongside the quays of the town.

No merchant vessel is permitted to anchor, or moor to the buoys, in the outer harbour without permission from the Military authorities.

Excepting those carrying special cargo for certain other parts of the harbour, merchant vessels are only permitted to anchor, or secure, in the northern part of the inner harbour, eastward of Isolotto Olivi.

Directions.—The land about Pola generally is not high, and the only remarkable points near the entrance are Capo Compare and Capo Brancorso, each with a fort or battery over them; both are steep and are the highest points on this part of the coast. The latter is about 7½ miles north-westward of Capo Promontore, and may be easily identified from it, being the first rather high land northward of that cape.

On approaching the harbour, the square fort, the town, the dockyard crane, and the amphitheatre may be seen at the head of the bay. *See* view B on chart 202.

A vessel should pass between the outer end of the breakwater and Punta Cristo, giving this point a berth of at least half a cable, then steer south-eastward for Penisola di San Pietro. There is but one passage into the inner harbour for large vessels, namely, between Isolotto Sant' Andrea and Penisola di San Pietro; smaller vessels can

Charts 201, 1440, 2158a.

Chart 202.

use the channel between Isolotti Sant' Andrea and Santa Caterina, which is marked by four light-beacons, two on each side of the channel.

- At night, the lights on the end of the breakwater, and Punta Peneda, the southern extremity of Isola Brioni Maggiore, indicate the position of the port, and the lights on Penisola di San Pietro, bearing 132° , lead in between the end of the breakwater and Punta Cristo.

Harbour regulations.—1. Merchant vessels entering Porto di Pola must signal their name and port of departure to the signal station on Forte Musile.

2. Within an imaginary line joining Punta Cristo and Capo Compare, a steam vessel must proceed at slow speed. In any case the speed must not exceed 8 knots.

3. If two vessels, proceeding in opposite directions should be making for the passage between Isolotti Sant' Andrea and Santa Caterina (*Lat. $44^{\circ} 52' N.$, Long. $13^{\circ} 49' E.$*), the vessel entering must give way to the vessel leaving.

Sailing vessels are prohibited from using the passage between Isolotti Sant' Andrea and Santa Caterina. These vessels should enter the mercantile port through the passage between Isolotti Sant' Andrea and Olivi, and, during the daytime, should round the above islet closely so as to leave an area clear for the alighting of civil aircraft.

4. Vessels entering at night, are warned that floating structures, carrying lights, may be placed in line, the direction being variable, for the use of military aircraft.

5. Vessels and craft of any description are prohibited from approaching and landing at the beaches, moles and quays in the following military areas:—

- Within imaginary lines joining Punta Grossa and Punta Zonchi, Punta Aguzzo and the radio mast in Valle San Pietro, the south-eastern extremity of Penisola di San Pietro and the southern extremity of Isolotto Olivi, the molehead at Valle Vergarola and the coast south-eastward, the molehead at Valle Figo and Capo Compare.

- It is also prohibited to approach, within a distance of 55 yards (50^m4), Isolotti Santa Caterina and Sant' Andrea, and also the beach between the reticolato eastward of Fisella, situated about half a mile south-eastward of Capo Compare, and the piers off Valle Figo.

Access is also prohibited to an area fronting the seaplane station southward of Valle Ronzi, mentioned on page 462, the limits of which are indicated by notice boards; as well as an area, 110 yards (100^m6) wide, along the western coast of Isolotto Cosada, page 462.

6. Within the entrance to the outer harbour, it is prohibited to discharge ashes, refuse or objects of any kind. If the presence of naphtha or benzine is detected on the waters of the harbour, the Port authorities should be notified immediately.

Seaplane regulations.—The area reserved for the movements of civil aircraft is comprised between imaginary lines joining the head of the breakwater extending from Capo Compare, Penisola di San Pietro, East Gramaticopulo airport, Isolotto Olivi, Punta Aguzzo, Punta Monumenti and Punta Cristo.

The movements of aircraft are signified, (a) by a green flag displayed at the mast of East Gramaticopulo airport, five minutes before arrival or departure and lowered when the manœuvre is completed; (b) by a blast of 30 seconds duration on the siren situated above the

Charts 201, 1440, 2158a.

Chart 202.

airport, when an aircraft is first sighted and when one is about to depart.

When these signals are made, vessels about to enter or depart from the harbour should await the completion of the manœuvre of the aircraft. 5

If, on the contrary, a vessel is in the act of entering, leaving or shifting berth, the aircraft will wait until the area is clear.

Town.—Pola is built on the southern side of the inner harbour, and is one of the most ancient towns in Istria; it is said to have been founded by the Colchians who had been sent in pursuit of Medea 10 and the Argonauts. Several interesting Roman remains are still visible, particularly the amphitheatre built of massive blocks of white marble. The only other building deserving notice is the cathedral, which was built in the ninth century. There is a marine hospital to which seamen are admitted. There are also an observatory and 15 barracks. The population, in 1939, was about 34,090.

The exports are coal, bauxite, flints, cement, wine and fruit; the imports mostly consist of food.

Communications.—There is regular steamer communication with other ports in the Adriatic. 20

The town is connected to the general railway system of Europe.

There is an air service to Venice and Trieste.

There is a radio station.

Fuel and supplies.—A moderate quantity of coal is usually kept in stock for bunkering and, in addition, there are government stocks of 25 coal and fuel oil.

Water is laid on to the quays and can also be obtained from water boats belonging to the naval station (*Lat. 44° 52' N., Long. 13° 51' E.*).

Fresh provisions are procurable.

Repairs.—Repairs to hull and machinery can be carried out. 30

Chart 201.

Caution.—Dumping ground.—A disused dumping ground for ammunition, indicated on the chart by pecked lines, exists from about 13 to 19 miles westward of the entrance to Porto di Pola.

Chart 202.

CANALE DI FASANA.—This channel lies between the mainland, 35 from Punta Cristo to Punta Barbariga, about 6 miles north-north-westward, on its eastern side, and Isole Brioni, on its western side. It is entered from southward between Punta Cristo and Punta Peneda, the southern extremity of Isola Brioni Maggiore, about $1\frac{1}{4}$ miles west- 40 south-westward, and is about a mile wide in its narrowest part, where Isolotti Cosada and San Girolamo lie nearly in mid-channel. Canale di Fasana is entered from north-westward between Punta Barbariga and Scoglio Cabula, the outermost of a group of islets and rocks lying westward of Isola Brioni Minore, about $2\frac{1}{4}$ miles south-south-west- 45 ward. The southern part consists of a bed of rock uniting Isole Brioni to the mainland and is bad holding ground. In the northern part a considerable number of vessels of any size can find shelter from all but north-westerly winds; there are, however, in this part of the channel, several rocky patches covered with a thin layer of mud and 50 weed, described on page 465, and vessels should anchor with caution.

Current.—The normal coast current is north-west-going, but its direction and rate are considerably affected by wind and the tidal

Charts 201, 1440, 2158a.

Chart 202.

streams ; the north-west-going tidal stream sometimes attains a rate of $2\frac{1}{2}$ knots ; the south-east-going tidal stream is weaker. In the narrows the streams are stronger, and when wind and tide are in the same direction occasionally attain a rate of 3 knots.

Channel.—Buoys.—Beacon.—The eastern side of Canale di Fasana, from about 2 cables north-north-eastward of Punta Cristo, is bordered by a shallow rocky bank, from one to 2 cables wide.

Isolotto San Girolamo, 56 feet (17^m1) high and bordered by a narrow, shallow bank, lies about half a mile north-westward of Punta Cristo, on the south-western end of a rocky bank, with depths of less than 6 fathoms (11^m0) over it, which extends from the coast of Istria. On this islet there is a quarry, the steep sides of which are conspicuous, especially from south-westward. A short pier, with a depth of 13 feet (4^m0) at its head, projects from the northern side of this islet.

Isolotto Cosada, 30 feet (9^m1) high and surrounded by a narrow, shallow bank, lies on the same rocky bank about 2 cables eastward of Isolotto San Girolamo and $2\frac{1}{2}$ cables offshore ; there is a least depth of $5\frac{1}{2}$ fathoms (10^m1) in the fairway of the passage between these two islets. A short pier, with a depth of about 10 feet (3^m0) at its head, projects from the north-eastern side of Isolotto Cosada (*Lat.* $44^\circ 54' N.$, *Long.* $13^\circ 48' E.$).

Between Punta Peneda and Punta Rancon, about $1\frac{1}{2}$ miles north-eastward, the south-eastern side of Isola Brioni Maggiore is indented. Val Terra Alta, on the western side of which there is a small pier, with a depth of about 6 feet (1^m8) at its head, lies close north-eastward of Punta Peneda. Valle Laura (Lavora) and Valle Rancon lie half a mile and one mile, respectively, farther north-eastward. These three coves are not suitable for anchorage.

On the eastern side of the channel, Valle Ronzi lies near the northern end of a bight between Punta Cristo and Punta Ronzi, about $1\frac{1}{2}$ miles north-north-eastward. Depths of less than 5 fathoms (9^m1) extend about 3 cables off Punta Ronzi and a detached 3-fathom (5^m5) patch lies about 2 cables south-westward of the point. A seaplane station with a large hangar stands on the shore at the southern end of the bight.

Val Bandon, which is crossed by an embankment, lies a short distance northward of Punta Ronzi and the village of Fasana, page 463, lies about a mile farther northward. Casa Fragiaco, which has a turret and is conspicuous, stands on the shore, about 4 cables southward of Fasana. Depths of less than 5 fathoms (9^m1) extend about $2\frac{1}{2}$ cables off this stretch of coast ; the bottom is rocky and unsuitable for anchorage. The western edge of the shallow shore bank, for a distance of about 3 cables south-south-westward of Fasana is marked by three conical buoys, painted in red and white stripes, with spherical topmarks.

On the western side of the channel, a shallow rocky bank extends about a cable eastward of Punta Rancon. Val Catena, the shores of which are bordered by a narrow shallow bank, is entered nearly midway between Punta Rancon and Punta Marban, about half a mile north-north-westward ; the submerged remains of a mole on the southern side of this cove are marked by an iron beacon with a white circular topmark. Vessels should pass northward of this beacon.

Between Punta Marban and Punta Saluga, about 3 cables northward, there is a conspicuous bathing pavilion, with two turrets.

Charts 201, 1440, 2158a.

Chart 202.

Porto Brioni is entered between Punta Saluga and Punta Carmen, about half a mile west-north-westward. A shallow rocky bank extends about a cable northward of Punta Saluga, and depths of less than 5 fathoms (9^m1) extend about 3 cables off Punta Carmen. At the head of this port, there is a harbour protected by two moles, the heads of which are about three-quarters of a cable apart; the shores of the harbour are bordered by a shallow bank. The village of Brioni, in which there are some conspicuous buildings, is situated round the shores of the harbour. Small vessels can secure to the northern mole or to a small mole which projects from the quay within the harbour. There are several mooring buoys off this port for the use of naval vessels. For anchorage, *see* page 465.

Between Punta Carmen and Punta Barbana, the north-western extremity of Isola Brioni Maggiore, about $1\frac{1}{4}$ miles west-north-westward, the coast is bordered by a narrow, shallow bank. Canale Stretto, the bottom of which is rocky and in the fairway of which there is a least depth of $1\frac{1}{4}$ fathoms (2^m3), separates Isola Brioni Maggiore from Isola Brioni Minore, northward, and is about half a cable wide; this channel can be used by small vessels, with local knowledge.

About half a mile eastward of the entrance to Canale Stretto, there is a group of five cylindrical deviation buoys; the central buoy is painted white and marked with the letters GB.

Between the south-eastern extremity of Isola Brioni Minore and Punta della Femmina, its north-western extremity, the eastern and northern sides of that island are indented by two unimportant bays; the coast falls steeply to the sea and is steep-to.

On the eastern side of the channel, the harbour of Fasana is formed by two moles enclosing a small area, in which there is a depth of 6 feet (1^m8), mud.

The coast in the vicinity of Fasana is generally low, well wooded and cultivated. The town of Dignano (*Lat.* 44° 57' N., *Long.* 13° 51' E.) is situated about 3 miles north-eastward of Fasana, on a hill, 443 feet (135^m0) high, and helps to point out the position of Fasana harbour. The campanile of the church in this town and also those of the villages of Gallesano (Galesano), $1\frac{3}{4}$ miles south-eastward, and Peroi, $2\frac{1}{4}$ miles west-south-westward, are conspicuous.

Punta Mertolin lies about $1\frac{3}{4}$ miles north-north-westward of Fasana. Casa Stratti, nearly midway between these points, and half a mile inland, at an elevation of 121 feet (36^m9), is conspicuous. Several mooring buoys have been placed off this stretch of coast. Valle Madonna, occasionally used by coasting vessels, lies close northward of Punta Mertolin. Two conspicuous limekilns, the northern red and the other grey, are situated on the coast about $1\frac{1}{4}$ miles north-north-westward of Punta Mertolin. Val Maricchio, frequented by small vessels, lies at the head of the bight between these limekilns and Punta Barbariga, about $1\frac{1}{4}$ miles north-westward; this point is low and a shallow, rocky bank extends about a cable off it. A short mole projects south-eastward from the coast, a short distance north-eastward of Punta Barbariga.

On the southern side of the northern entrance to Canale di Fasana, Scoglio Cabula is the outermost of a group of islets and rocks lying westward of Isola Brioni Minore, and is situated about a mile west-north-westward of Punta della Femmina, the north-western extremity

Charts 201, 1440, 2158a.

Chart 202.

of that island, with Isolotto San Marco, 19 feet (5^m8) high, midway between. The village of Gallesano in line with Casa Stratti, bearing about 105°, leads about a mile northward of Scoglio Cabula.

- 5 **Telegraph cable.—Beacons.**—A submarine cable, indicated on the chart, is laid across Canale di Fasana from southward of Fasana to southward of Punta Saluga; the shore ends are each marked by a beacon tower. Fishing with nets or a trawl, or landing without permission, is prohibited within a distance of half a cable from the Beacon
10 tower southward of Fasana.

Dangers.—Buoy.—Secca Cosada, with a least depth of 2½ fathoms (4^m1) over it, lies about 3½ cables north-north-westward of Isolotto Cosada. This shoal is joined to the shore bank, north-eastward, by a ridge over which there are depths of 4½ fathoms (7^m8); depths of
15 less than 5 fathoms (9^m1) extend about a cable south-westward of the light-tower by which the shoal is marked.

Forte Musil in line with Punta Cristo, bearing 172°, leads through the passage between Isolotti San Girolamo and Cosada, and westward of the light-tower marking Secca Cosada, in a depth of 4½ fathoms
20 (7^m8). See view A on chart 202.

Secca di Mertolina, with a depth of 2 fathoms (3^m7) over it, lies about half a mile south-westward of Punta Mertolin; this shoal is marked by a conical buoy, painted in red and black stripes, surmounted by a red ball.

- 25 **Lights.—Light-buoys.—Fog signal.**—A light is exhibited, at an elevation of 66 feet (20^m1), from a square tower and dwelling, 49 feet (14^m9) in height, on Punta Peneda (*Lat.* 44° 53' N., *Long.* 13° 45' E.). See view on chart 202.

Several electric lights (one on a high mast) are exhibited, occasion-
30 ally, in the vicinity of this lighthouse.

A radio fog signal is transmitted from Punta Peneda lighthouse.

- Two lights, vertically disposed, are exhibited, at elevations of 31 and 25 feet (9^m4 and 7^m6), respectively, from a black iron framework structure, 23 feet (7^m0) in height, on the western extremity of Isolotto San
35 Girolamo.

A light is exhibited, at an elevation of 15 feet (4^m6), from a red iron framework structure, 12 feet (3^m7) in height, on the northern side of Isolotto San Girolamo.

- A light is exhibited, at an elevation of 35 feet (10^m7), from a red
40 iron framework structure, 29 feet (8^m8) in height, on the southern side of Isolotto San Girolamo.

These two last mentioned lights in line, bearing 187°, lead between the bank extending from Punta Rancon and Secca Cosada. They are, however, normally extinguished and are only exhibited when the light
45 on Secca Cosada is extinguished.

A light is exhibited, at an elevation of 22 feet (6^m7), from a red circular concrete tower, 24 feet (7^m3) in height, situated near the south-western end of Secca Cosada.

- A spherical light-buoy, painted in black and white bands, exhibiting
50 a *green flashing* light showing a *short flash every 3 seconds*, marks the eastern edge of the bank extending from Punta Rancon.

A light-buoy, painted in red and white vertical stripes and exhibiting a *green fixed* light is moored about 3½ cables north-eastward of Secca Cosada light-tower; it marks the alighting point for seaplanes. When

Charts 201, 1440, 2158a.

Chart 202.

night flying is taking place, an illuminated landing area, consisting of 20 lights connected by wire cables, will be established.

A light is exhibited, at an elevation of 26 feet (7^m9), from a white circular iron tower, with black bands, on a masonry base, 28 feet (8^m5) in height, situated about a cable north-eastward of Punta Saluga. 5

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 20 feet (6^m1) in height, on the head of the northern mole at Porto Brioni.

A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron column, 18 feet (5^m5) in height, on the head of the northern mole at Fasana. 10

A light is exhibited, at an elevation of 22 feet (6^m7), from a black iron column, 18 feet (5^m5) in height, on the head of the southern mole at Fasana. 15

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron tower on a concrete base, 24 feet (7^m3) in height, on Scoglio Cabula. 15

Areas unsuitable for anchorage.—There are several areas unsuitable for anchorage, where the bottom is rock covered by a thin layer of mud, in Canale di Fasana. One of these is in the southern part of the channel; another midway between the villages of Fasana and Brioni; two areas, at distances of about one mile and 1½ miles, respectively, exist west-north-westward of Fasana; another at a short distance south-eastward of an imaginary line joining the village of Peroi with the south-eastern extremity of Isola Brioni Minore; two areas off the eastern coast of Isola Brioni Minore; foul ground also extends about half a mile off Punta Mertolina. There are other areas in the northern part of the channel where the rocky bottom may be covered by a thin layer of mud and weed. 30

Anchorage.—Vessels of any size can find good anchorage in Canale di Fasana, especially in south-westerly and south-easterly winds. The Bora is frequently violent, and north-westerly winds cause a heavy sea.

Vessels can anchor in the vicinity of Porto di Brioni, Fasana and Val Maricchio, over a bottom of sand and mud, good holding ground. When choosing an anchorage care should be taken to avoid the numerous patches of rocky ground. 35

Prohibited anchorage.—Anchorage is prohibited in an area 1½ cables northward and 5 cables southward of an imaginary line joining Punta Saluga light-tower with the light-structure on the head of the southern mole at Fasana. 40

Directions.—When entering Canale di Fasana from the southward, the best channel is between Isola Brioni Maggiore and Isolotto San Girolamo; it is deep and clear of dangers. A vessel should steer north-eastward through it and bring the two leading light-structures on Isolotto San Girolamo in line astern, bearing 187°, and steer to maintain this transit astern which leads between Secca Cosada and the bank off Punta Rancon; the channel here is 1½ cables wide with depths of from 5½ to 9 fathoms (10^m5 to 16^m5) close to the leading line. When abreast the light-tower off Punta Saluga, course may be altered north-westward or continued as before if bound for Fasana (Lat. 44° 56' N., Long. 13° 48' E.). 50

If entering by the narrow passage between Isolotti San Girolamo

Charts 201, 1440, 2158a.

Chart 202.

and Secca Cosada, a vessel should steer 000° in mid-channel, where there is a depth of $5\frac{1}{2}$ fathoms (10^m1); Forte Musile over Punta Cristo astern, *see* View A on chart 202, also leads through, but not in the
 5 best water. If the draught of the vessel permits, this latter mark may be followed, leading over the western edge of Secca Cosada and westward of the light-tower, until abreast of the light-tower off Punta Saluga, when course may be altered as required. If it is not desirable to cross the tail of Secca Cosada, a vessel should steer north-westward
 10 when past Isolotto San Girolamo and bring the leading light-structures on that islet in line astern, when proceed as before directed.

At night a vessel should round the western end of Isolotto San Girolamo, and steer to pass about midway between Secca Cosada light-tower and the light-buoy off Punta Rancon, thence northward, until
 15 abreast the light-tower off Punta Saluga, when proceed as directed by day.

Vessels passing northward of Isole Brioni on the way to Fasana should round Scoglio Cabula lighthouse at a prudent distance. Secca Porèr, on the northern side of the northern approach, with the clearing
 20 mark southward of it, is described on page 469, and the 2-fathom (3^m7) shoal south-westward of Punta Mertolin on page 464.

ISOLE BRIONI.—This group of islands lies north-westward of the entrance to Porto di Pola, parallel with the coast and separated from it by Canale di Fasana. The islands are composed of marble
 25 and range from 20 to 189 feet (6^m1 to 57^m6) in height, and are covered with thick bush and low trees. Their coasts are indented with many little bays and inlets. Numerous islets, rocks and shoals lie westward of the two principal islands, Isola Brioni Maggiore and Isola Brioni Minore.

30 **Isola Brioni Maggiore.**—**Western side.**—This island is 189 feet (57^m6) high; Fort Brioni Maggiore (Tegetthoff), on its summit, situated near the middle of the island, is conspicuous. The western side of Isola Brioni Maggiore is bordered by a narrow, shallow, rocky bank.

Val Can, on the northern side of which there are three conspicuous
 35 houses, is entered between Punta Peneda, page 461, and Punta Grossa, about a quarter of a mile north-westward; there is a conspicuous quarry on Punta Grossa. Valle Lago is entered between a point situated about a quarter of a mile northward of Punta Grossa and a point about a quarter of a mile farther north-north-eastward. These
 40 two coves are not suitable for anchorage.

Punta Valizi lies about a mile northward of Punta Grossa (*Lat.* 44° 53' N., *Long.* 13° 45' E.). Porto Madonna is entered between Punta Valizi and a point about three-quarters of a mile northward. There are two conspicuous houses on the northern entrance point and
 45 a short pier, with a depth of 8 feet (2^m4) at its head, projects from the point. Between the point, just mentioned, and Punta Barbana, the north-western extremity of Isola Brioni Maggiore, lie Val Salsa, close westward of the northern entrance point of Porto Madonna, Val Pojer, midway between the two points, and the small bay of Barbana,
 50 close southward of the point of that name. None of these small bays is suitable for anchorage. For anchorage in Porto Madonna, *see* page 468.

Off-lying islets.—**Dangers.**—**Beacon.**—Porto Madonna is shel-

Charts 201, 1440, 2158a.

Chart 202.

tered by a group of five islets, each of which is bordered by a shallow, rocky bank, the extent of which can best be seen on the chart.

Isolotto Orzéra, 39 feet (11^m9) high, lies about a quarter of a mile south-westward of Punta Valizi and is separated from the western side of Isola Brioni Maggiore by a channel about 1½ cables wide between the banks on either side; in the fairway of this channel there are depths of more than 10 fathoms (18^m3).

Isolotto Madonna, 16 feet (4^m9) high, lies with its southern end about 2 cables northward of Punta Valizi. This islet is connected to the eastern shore of Porto Madonna by a bank, with depths of less than 5 fathoms (9^m1) over it.

Isolotto Vanga, the largest of the five islets, and the only one that is wooded, lies with its southern end about 4 cables north-westward of Isolotto Orzéra. Isolotto Vanga is in two parts, joined by a narrow isthmus; the southern part is 23 feet (7^m0) high and the northern part is 26 feet (7^m9) high. A bank, with depths of less than 5 fathoms (9^m1) over it, extends 3½ cables south-south-eastward of this islet, leaving a very narrow passage between it and the bank extending from Isolotto Orzéra, in the fairway of which there is a least depth of 5½ fathoms (10^m1).

Isolotto Gallia, 20 feet (6^m1) high, the northernmost of the group, lies 2 cables north-westward of Isolotto Vanga, joined to the latter by a shallow reef.

The channel between Isolotto Gallia and Isola Brioni Maggiore, north-eastward, is about 1½ cables wide between the banks on either side and has a least depth of 3½ fathoms (6^m4) in the fairway. Secca Barbana, with a depth of 1½ fathoms (2^m3) over it, lies in the north-western approach to this channel, about 2 cables south-westward of Punta Barbana; Secca Pojer, with a depth of 3 feet (0^m9) over it, lies in the southern approach, at a distance of about 4 cables eastward of Isolotto Gallia. Secca Pojer is marked, on its eastern side, by a pole beacon, 11 feet (3^m4) high, surmounted by a ball and painted in red and black bands. Secca Madonna, with a depth of 2 fathoms (3^m7) over it, lies nearly midway between Secca Pojer and the north-eastern extremity of Isolotto Vanga.

Isolotto Gronghera, 33 feet (10^m1) high; the westernmost of the group of islets, lies about a quarter of a mile west-north-westward of Isolotto Vanga. Secca Gronghera, with a depth of 3 fathoms (5^m5) over it, rock, lies about half a mile north-westward of the islet of that name; 2½ cables westward of this shoal there is a rocky bank, with a least depth of 6 fathoms (11^m0) over it.

Forte Musile, bearing 126° and seen over Punta Peneda (*Lat.* 44° 53' N., *Long.* 13° 45' E.), leads south-westward of the islets and dangers off-lying Isola Brioni; at night, Punta Peneda light, in sight and bearing less than 114°, also leads south-westward.

Isola Brioni Minore.—**Western side.**—This island lies northward of Isola Brioni Maggiore, and is separated from it by Canale Stretto, page 463. Porto San Nicolò, with two small moles at its head, is situated on the southern side of Isola Brioni Minore; on the western side of the island, there are two small bays, of which Valle Ton is the southern and Valle Valnera is the northern. For anchorage, see page 468.

Off-lying islets and dangers.—A group of islets, each surrounded

Charts 201, 1440, 2158a.

Chart 202.

by a shallow bank, and a number of rocky shoals, lie westward of Isola Brioni Minore. Scoglio Zumpin, 6 feet (1^m8) high, lies near the outer end of a reef which extends about 2 cables westward and
 5 then 2 cables south-south-westward from the south-western extremity of the island. The campanile of Fasana church in line with the northern extremity of Isola Brioni Maggiore, bearing about 089°, leads about 1½ cables southward of Scoglio Zumpin. Isolotto Zumpin, 26 feet (7^m9) high and sparsely covered with vegetation, lies about
 10 2½ cables north-westward of Scoglio Zumpin; a shallow reef extends about a cable eastward of this islet and is connected to the reef extending from the south-western extremity of Isola Brioni Minore by a rocky bank, with depths of 5 fathoms (9^m1) over it.

Isolotto Toronda (*Lat.* 44° 56' *N.*, *Long.* 13° 43' *E.*), 36 feet (11^m0)
 15 high and bare, lies about 2 cables northward of Isolotto Zumpin; a shallow bank extends 1½ cables northward of Isolotto Toronda and Scogli Valnera, two in number and partly covered at low water, lie on a reef between it and Punta della Femmina, the north-western extremity of Isola Brioni Minore, about 3½ cables east-north-eastward. Some
 20 houses can be seen on Isolotto Toronda.

Isolotto Gaza, 42 feet (12^m8) high and on which there is a building surrounded by cultivation, lies westward of Isolotto Toronda, separated by a narrow channel, in the fairway of which there is a least depth of 4 fathoms (7^m3). A rocky bank, with depths of less than
 25 10 fathoms (18^m3) over it, extends about three-quarters of a mile westward and west-south-westward of Isolotto Gaza; Secca Astura, with a depth of 4 fathoms (7^m3) over it, and Secca Gaza, with a least depth of 3½ fathoms (5^m9) over it, lie on this bank at distances of half a mile west-south-westward and westward, respectively, from Isolotto
 30 Gaza. Between these two shoals and the islet, there are other shoal heads, the extent of which can best be seen on the chart; the shoalest of these heads, with a depth of 1½ fathoms (3^m2) over it, lies about 2 cables south-south-westward of the southern extremity of Isolotto Gaza.

35 Isolotto San Marco and Scoglio Cabula are mentioned previously; Secca Burchio, with a depth of 2 fathoms (3^m7) over it, lies about 2 cables east-south-eastward of Scoglio Cabula.

Anchorage.—Directions.—In Porto Madonna, there is anchorage for small vessels, with local knowledge, about 1½ cables north-eastward
 40 of Isolotto Madonna, in a depth of 8 fathoms (14^m6). The best channel of approach to this anchorage is that between Isolotto Orzéra and Isola Brioni Maggiore, avoiding the shallow bank extending south-westward from the southern end of Isolotto Madonna.

Porto San Nicolò affords anchorage to small vessels, with local
 45 knowledge, in a depth of about 4 fathoms (7^m3), mud, well sheltered by Isola Brioni Maggiore. Small vessels can also secure along both sides of the eastern mole or to the head of the western mole.

A vessel approaching Porto San Nicolò from westward, should steer with the campanile of Fasana church in line with the northern extremity of Isola Brioni Maggiore, bearing about 089°, and when about
 50 2 cables off Punta Barbana should alter course as required for the anchorage.

In case of necessity during a Bora, a vessel may anchor about 1½ miles westward of the southern part of Isolotto Vanga, in a depth

Charts 201, 1440, 2158a.

Chart 202.

of about 23 fathoms (42^m1), with Punta Peneda lighthouse bearing about 113°, distant 2½ miles.

Chart 201.

COAST.—Islets and dangers.—Beacons.—Between Punta Bar- 5
bariga and Punta Auro, about 7 miles north-westward, the coast is bordered by islets, rocks and sunken dangers, which, with the exception of Secca Porèr, do not extend more than a mile offshore. There are several coves, seldom visited except by coasters, which are all open west-
ward. There is little cultivation and the hills are nearly all wooded. 10

Chart 202.

Between Punta Barbariga and Punta Grossa, about a mile north-
westward, there are two small bays, both of which are unsuitable for
anchorage; Valle San Benedetto is the southern of these bays and
Valle Lunga, the northern. 15

Scoglio Porèr, low, bare and light-coloured, the southernmost of the
above-water rocks bordering this coast, lies about 8½ cables west-
south-westward of Punta Grossa. A rocky shoal, with a depth of
5½ fathoms (10^m5) over it, lies about 1½ cables south-eastward of
Scoglio Porèr. 20

Secca Porèr, with a depth of 4½ fathoms (8^m2) over it, rock, lies
about a mile west-south-westward of Scoglio Porèr; this shoal is
steep-to and is the outermost danger off this part of the coast. The
campanile of Dignano church in line with the red limekiln on the
eastern shore of Canale di Fasana, bearing about 101°, leads south- 25
ward of Secca Porèr.

Secca Caligheri, with a depth of 3 fathoms (5^m5) over its south-
eastern side, lies from 2 to 3 cables north-north-eastward of Scoglio
Porèr; and Secca Bus, with a least depth of 3½ fathoms (6^m4) over it,
lies from 4½ to 6½ cables north-eastward of Scoglio Porèr; the eastern 30
end of this shoal lies about 2 cables offshore.

The head of Val Bus is situated about 3 cables northward of Punta
Grossa (*Lat.* 45° 00' N., *Long.* 13° 43' E.).

Chart 201.

Isolotto Colonne, low and bare, lies about 6 cables north-westward 35
of Punta Grossa and is connected to the coast, close northward, by
a shallow bank. Porto Colonne, in which there is a short mole, is
situated eastward of this islet. The chapel of San Giacomo stands
at the head of this port. For anchorage, *see* page 471.

Punta Dantola, thickly wooded, lies about 2½ cables north-westward 40
of Isolotto Colonne; Secca Dantola, with a depth of 2½ fathoms (5^m0)
over it, lies about 1½ cables south-westward, and another shoal, with
a depth of 3 fathoms (5^m5) over it, lies the same distance north-west-
ward of Punta Dantola, with a 6-fathom (11^m0) rocky patch about
3½ cables farther north-westward. 45

Valle San Paolo is entered between Punta Dantola and Punta
Gustigna, about 1½ miles north-westward. Isolotto Passaglio lies
close off the northern side of this bay. Isolotto Gustigna, low and
bare, lies about half a mile south-westward of the point of that name;
a 3½-fathom (5^m9) rocky patch lies about 1½ cables south-south-east- 50
ward of this islet, and a shoal, with a depth of 5½ fathoms (9^m6) over
it, lies about 2 cables westward of the islet. For anchorage in Valle
San Paolo, *see* page 471.

Charts 1440, 2158a.

Chart 201.

Secca Pioni, with a depth of 6 feet (1^m8) over it, and easily distinguished by the light colour of the water over it, lies about 6 cables westward of Punta Gustigna.

- 5 Isolotto Vestre, 12 feet (3^m7) high, lies about 1½ miles north-north-westward of Punta Gustigna, separated from the coast by a boat passage about a cable wide, in which there is a depth of 6 feet (1^m8). Porto Vestre is entered between the islet of that name and a point, about half a mile north-north-westward. On the northern side of the
10 port, there is a small mole, which is almost submerged. The port is easily distinguished by a quarry close north-eastward of the mole. For anchorage, *see* page 471.

- Isolotto Polari, 12 feet (3^m7) high, lies about 2 cables off the north-western entrance point of Porto Vestre, connected to it by a shallow
15 bank. Scoglio Rivera, 6 feet (1^m8) high, lies on the end of a reef which extends about 3 cables south-south-westward of Isolotto Polari. A bank, with uneven depths of less than 5 fathoms (9^m1) over it, extends about 1½ miles south-south-eastward of Scoglio Rivera; Isolotti Due Sorelle, sparsely covered with grass, lie on the southern end of this
20 bank. The south-eastern and larger of these two islets is 19 feet (5^m8) high and lies about half a mile off the mainland; a masonry beacon, about 26 feet (7^m9) in height, and painted in red and white bands, stands on the western extremity of the north-western islet. There is a shoal head, with a depth of 2½ fathoms (4^m1) over it, about
25 3 cables north-north-eastward of this beacon, and another shoal head with a depth of 2½ fathoms (4^m6) over it, about 2 cables farther north-westward. For anchorage, *see* page 471.

- Valle Polari lies on the northern side of the north-western entrance point of Porto Vestre and Valle Cuvi (Covi) lies about a mile farther
30 west-north-westward.

- Scoglio Piroi Grande, with Scoglio Piroi Piccolo about 1½ cables west-north-westward, lies about a mile westward of Isolotto Polari. The smaller of these two rocks lies about 2 cables off the mainland and the same distance eastward of Isolotto Sant' Andrea. Both
35 these rocks are low and bare; a masonry beacon, 19 feet (5^m8) in height, and painted in red and white bands, stands on Scoglio Piroi Piccolo.

- Punta Auro, steep-to and 121 feet (36^m9) high, lies three-quarters of a mile north-westward of Scoglio Piroi Piccolo (*Lat.* 45° 04' N.,
40 *Long.* 13° 38' E.).

- A chain of islets extends about 1½ miles south-south-westward of Punta Auro, and terminates in Scoglio San Giovanni in Pelago, on which stands a lighthouse. A sunken rock lies about a cable north-westward of this rock. Isolotto Sant' Andrea, the largest of this
45 chain, 62 feet (18^m9) high, is wooded. It is nearly divided into two by a low neck in the centre, and has a monastery on its northern part; a shallow bank extends a short distance westward of this islet. Between Scoglio San Giovanni in Pelago and Isolotto Sant' Andrea are Isolotto San Giovanni in Pelago (Marasso) and Isolotto Sturago
50 (Astorga). The former consists of two wooded hills, united by an isthmus; the western hill is 50 feet (15^m2) high and there is a conspicuous chapel on the eastern hill.

Scoglio Asino, low, jagged and covered with trees, lies near the outer end of a reef which extends 3½ cables westward from a point on the

Charts 1440, 2158a.

Chart 201.

coast, situated about half a mile southward of Punta Auro. The outer end of this reef is marked by an iron beacon, painted in red and white stripes, and surmounted by a red ball. Scoglio Semenza, bare and about 3 feet (0^m9) high, lies about 1½ cables off the south-western side of Punta Auro. 5

Light.—Fog signal.—A light is exhibited, at an elevation of 75 feet (22^m9), from a white octagonal tower, 69 feet (21^m0) in height, on Scoglio San Giovanni in Pelago. See view on chart.

Distress signals are made, see page 44. 10

An air fog signal is sounded from San Giovanni in Pelago lighthouse in answer to the fog signals of vessels.

Anchorages.—Small vessels, with local knowledge, can anchor in Porto Colonne, north-eastward of the islet of that name, in a depth of 3½ fathoms (5^m9), with a hawser ashore; or secure to the mole. 15

Valle San Paolo affords good anchorage to vessels, with local knowledge, during a Bora; with south-westerly winds, this anchorage is dangerous.

Porto Vestre is a good anchorage for small vessels, with local knowledge, except in westerly winds. 20

Small vessels can anchor eastward of Isolotti Due Sorelle, in a depth of 6 fathoms (11^m0), sand.

Coast.—Islets and dangers.—The coast between Punta Auro and Punta Croce, about 3 miles northward, is indented and several islets and dangers lie off it. 25

Chart 1559, plan of Port Rovigno.

A shoal, with a least depth of 6½ fathoms (12^m3) over it, lies about 2 cables westward of Punta Auro. Isolotto Bagnole, which is steep-to, lies about 6 cables west-north-westward of the same point; this islet is low and bare, except for some shrubs on its summit. 30

Val di Lone lies close eastward of Punta Auro (*Lat.* 45° 04' N., *Long.* 13° 37' E.).

Isolotto Santa Caterina, situated about 3 cables northward of Punta Auro, has two cultivated hills, the western of which is 75 feet (22^m9) high. In the centre of the islet there is a conspicuous red building. Secca Sassi, with a least depth of 3½ fathoms (6^m4) over it, lies about 1½ cables west-south-westward of Isolotto Santa Caterina. Val Sabbionera lies eastward of this islet. 35

The city of Rovigno d'Istria, which contained about 9,500 inhabitants, in 1939, stands on a rocky peninsula a short distance northward of the eastern end of Isolotto Santa Caterina; there is a conspicuous campanile on the summit of the peninsula and the peninsula terminates in Punta Santa Eufemia. Porto di Rovigno, page 472, is divided into two parts by this peninsula. 40

Valdibora, open westward, is entered between Punta Santa Eufemia and Punta Mouccia (Muccia), about 6 cables northward. At the north-western end of the bay there is a shallow boat harbour, protected by two short moles. The eastern and northern sides of this bay are bordered by a narrow, shallow bank, which is rocky in places. Secca Squero, with a least depth of 5 fathoms (9^m1) over it, lies nearly midway between the entrance points of Valdibora. Secca Nueva, with a least depth of 4 fathoms (7^m3) over it, lies about 2 cables south-westward of Punta Mouccia. 50

The larger of the two Isolotti Figarola, which is 42 feet (12^m8) high

Chart 1559, plan of Port Rovigno.

and can be distinguished by a ruined house on it, lies about 3 cables westward of Punta Mouccia; a bank, with depths of less than 5 fathoms (9^m1) over it, extends about a cable northward of this islet. The smaller of these islets lies close south-westward of the larger, and is connected to it by a reef. See view on chart 1559.

Punta Figarola lies about half a mile north-westward of Punta Mouccia. A bank, with depths of less than 5 fathoms (9^m1) over it, extends about a cable off Punta Figarola. Secca Figarola, with a depth of 3½ fathoms (6^m9) over it, lies about 3 cables south-westward of this point and 2 cables off the northern end of Isolotti Figarola. *Chart 201.*

Between Punta Figarola and Punta Croce, about 1½ miles north-westward, the coast is bordered by a shallow bank, which is about a cable wide off the former point and as much as 2½ cables wide at a short distance southward of the latter point.

Chart 1559, plan of Port Rovigno.

Porto di Rovigno.—This port consists of Porto Santa Caterina and Val Sabbionera, on the south-eastern side of the peninsula on which the city of Rovigno stands, and the southern part of Valdibora, north-eastward of the peninsula. There is a mooring buoy in Val Sabbionera.

Porto Santa Caterina is protected westward by Molo Nazario Sauro, which extends half a cable southward and then a shorter distance south-eastward. The eastern side of the port is quayed. Molo Vittorio Emanuele III extends a short distance south-south-eastward from the middle of Riva Nazario Sauro which forms the northern side of the port.

In the southern part of Valdibora, Riva IV Novembre, about a cable long, projects a short distance from the line of quays extending north-eastward of the city. This quay is connected to the general railway system. Two mooring buoys are laid off the quay. About a cable north-eastward of Riva IV Novembre, there is a small mole, with a depth of about 6 feet (1^m8) at its head.

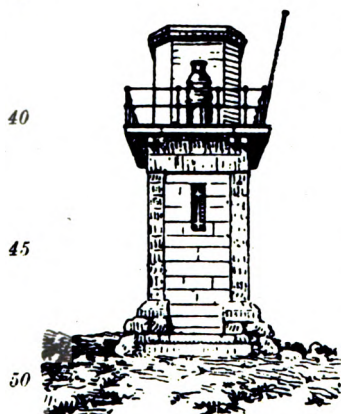
Lights.—Buoy.—A light is exhibited, at an elevation of 62 feet (18^m9), from a square whitish stone tower with a gallery, 25 feet (7^m6) in height, on Punta Santa Eufemia (*Lat. 45° 05' N., Long. 13° 38' E.*).

A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron column, 18 feet (5^m5) in height, on the head of Molo Nazario Sauro.

A light is exhibited, at an elevation of 15 feet (4^m6), from a black iron column, 13 feet (4^m0) in height, on the head of Molo Vittorio Emanuele III.

A light is exhibited, at an elevation of 23 feet (7^m0), from a black iron column, 20 feet (6^m1) in height, on the south-western corner of Riva IV Novembre.

A buoy, painted in black and white stripes and surmounted by a black ball, marks the eastern edge of the bank, with depths of less than 3 fathoms



Punta Santa Eufemia light-tower.

Charts 201, 1440, 2158a.

Chart 1559, plan of Port Rovigno.

(5^m5) over it, which extends about three-quarters of a cable off the eastern side of Isolotto Santa Caterina.

Anchoragees.—Berths.—The best anchorage for large vessels, in the vicinity of Rovigno, is northward of Santa Eufemia church, in depths of from 11 to 13 fathoms (20^m1 to 23^m8), about 1½ cables offshore. Small vessels can anchor farther eastward. The bottom is black mud, mixed with sand, good holding ground, except in the vicinity of Secca Squero. In a Bora, small vessels prefer to anchor southward of the city.

There is good anchorage for large vessels, in a Bora, about 2½ cables north-westward of Isolotto Santa Caterina; or about 3½ cables south-westward of Isolotto Bagnole.

Small vessels can anchor between Isolotti Figarola and Punta Mouccia, over a bottom of sand, good holding ground.

Val di Lone affords shelter only against southerly winds.

Porto Santa Caterina is only accessible to small vessels.

Chart 201.

There is temporary anchorage for large vessels, in a Bora, in a depth of about 17 fathoms (31^m1), sand, with Santa Eufemia church bearing about 082°, distant 3½ miles, and San Giovanni in Pelago lighthouse bearing 123°.

Chart 1559, plan of Port Rovigno.

Vessels can berth along both sides of the outer arm of Molo Nazario Sauro, where there are depths of from 13 to 16 feet (4^m0 to 4^m9), or along the eastern side of the inner arm, where there are depths of from 11 to 13 feet (3^m4 to 4^m0).

There are depths of from 16 to 19 feet (4^m9 to 5^m8) alongside Molo Vittorio Emanuele III and depths of about 6 feet (1^m8) alongside the quays on either side of this mole.

Vessels can berth alongside Riva IV Novembre, where there are depths of from 23 to 26 feet (7^m0 to 7^m9).

Prohibited anchorage.—Anchorage is prohibited between Molo Nazario Sauro and Isolotto Santa Caterina (*Lat.* 45° 05' N., *Long.* 13° 38' E.); this area is marked by two inverted white anchors.

Directions.—On making the land abreast Rovigno d'Istria, the high conspicuous campanile of Santa Eufemia church will be readily made out. See view on chart 1559. A vessel may pass on either side of Isolotto Bagnole, taking care to avoid Secca Sassi. A vessel approaching Porto Santa Caterina from southward, should pass between the buoy marking the bank extending from Isolotto Santa Caterina and the mooring buoy eastward of it.

Port facilities.—Trade.—Communications.—There are two hospitals and several factories, an active fishing industry and a small ship repairing yard for wooden vessels.

Water is laid on to Riva IV Novembre. Fresh provisions are procurable.

Bauxite is exported.

There is regular steamer communication with Trieste, Pola and Zadar.

The city is connected to the general railway system.

Chart 1559, plan of Canale di Leme.

CANALE DI LEME.—This narrow inlet is entered between Punta

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Chart 1559, plan of Canale di Leme.

Croce and Punta Tiolle, about a mile northward. It is bordered by high land, which is steep and covered with thick bush and trees; Valle Draga (Leme torrent) lies at the head of the inlet. The depths
 5 are considerable in the western part of Canale di Leme; towards its head, the depths gradually decrease and its head is shallow. The bottom is hard mud, good holding ground throughout. Canale di Leme is exposed to westerly winds and sea; the Bora blows strongly with squalls in the direction of the channel; the Scirocco is squally
 10 and shifts its direction.

On the southern side of the entrance, between Punta Croce and a point, about a mile north-eastward, there are three coves, Valli Faborsa, Saline and San Felice. In Valle Saline, the middle one of these coves, there is a small ruined mole on the south-western side and the chapel
 15 of San Giovanni stands near its northern entrance point; the head of this cove is shallow.

On the northern side of the entrance to Canale di Leme, Isolotto Conversada, 50 feet (15^m2) high and covered with trees, lies on a bank which extends about 3 cables off the western side of Punta
 20 Tiolle. Casa Cerlenca, which is conspicuous, stands on the northern side of the inlet, about a mile eastward of Punta Tiolle. At Cul di Leme, near the head of the inlet, there is a small quay and a group of houses. A mooring buoy is laid about 1½ miles from the head of the inlet.

25 Dangers.—Buoys.—Beacon.—Secca Leme lies in the approach to Canale di Leme, with its eastern end, over which there is a depth of 1½ fathoms (3^m2), situated about a mile north-westward of Punta Croce, whence it extends about half a mile west-south-westward. The eastern end of this shoal is marked by a buoy, painted in black
 30 and red stripes, and surmounted by a red ball.

Secca Conversada, with a depth of 1½ fathoms (2^m7) over it, lies about a quarter of a mile south-westward of the islet of that name. The eastern side of this shoal is marked by a buoy, painted in red and black stripes, and surmounted by a red ball.

35 Secca Foiaga (Fojaga), with a depth of 6 feet (1^m8) over it, rock, lies at the outer end of a shallow bank, which extends 1½ cables southward from a point on the northern side of Canale di Leme, situated about 4 cables eastward of Punta Tiolle (*Lat.* 45° 08' N., *Long.* 13° 36' E.). This shoal is marked, on its southern side, by a
 40 white iron pole beacon, 16 feet (4^m9) in height and surmounted by two framework discs at right angles.

Anchorage.—Directions.—The best anchorage for large vessels is south-south-eastward of Casa Cerlenca, in a depth of about 18 fathoms (32^m9). Small vessels can find good anchorage, exposed only to
 45 westerly winds, in Valle Saline, southward of San Giovanni chapel, in a depth of about 13 fathoms (23^m8).

The best channel into Canale di Leme is between Secca Leme, and Punta Croce; this point is high, steep-to and easily distinguished from a distance. About 3 cables southward of Punta Croce, a bank
 50 extends about 3 cables offshore. There is a channel on the northern side, between Secche Leme and Conversada, about 3 cables wide.

Chart 201.

COAST.—Between Canale di Leme and Porto di Parenzo, about

Charts 201, 1440, 2158a.

Chart 201.

6 miles northward, the coast becomes rather lower and is indented with several inlets; but with the exception of Porto Fontane and Porto di Parenzo, they only afford shelter to very small vessels with offshore winds. This coast is bordered by islets, rocks and shoals, which at one part extend more than $1\frac{1}{2}$ miles offshore, and a vessel should avoid closing this part of the coast. At night, the light on Punta del Dente (*Lat.* $45^{\circ} 18' N.$, *Long.* $13^{\circ} 34' E.$) should be kept in sight, and by day, the lighthouse should be kept bearing more than 013° .

Chart 1559, plan of approaches to Ports Fontane and Orsera.

Punta Petolon lies about half a mile north-north-westward of Punta Tiole; Valle Porticcio is situated about 2 cables south-eastward, and Valle Monti about the same distance north-eastward of this point. Porto di Orsera lies about half a mile northward of Punta Petolon.

Off-lying islets and dangers.—Beacons.—Buoy.—Isolotto Lunga, 31 feet (9^m4) high and sparsely covered with vegetation, lies about half a mile westward of Punta Petolon. Scoglio Galopon, bare and bordered by a shallow bank, about half a cable wide, lies about 2 cables north-eastward, and a rocky shoal, with a depth of $3\frac{1}{4}$ fathoms (5^m9) over it, lies about $1\frac{1}{2}$ cables northward of the eastern end of Isolotto Lunga. Secca Sasso, which breaks, lies about a cable west-north-westward of the western end of Isolotto Lunga, with a depth of 4 fathoms (7^m3) in the passage between; Secca Sasso is marked by an iron pole beacon, 14 feet (4^m3) in height, painted in red and white stripes and surmounted by a red ball.

Secca Marmi, with a least depth of 3 feet (0^m9) over it, lies from about 5 to $5\frac{1}{4}$ cables west-north-westward of the western end of Isolotto Lunga; there is a light-beacon on this shoal. Secca Campanile, with a depth of $3\frac{1}{4}$ fathoms (6^m4) over it, lies about 3 cables north-eastward, and Secca Marmi di Mezzo, with a depth of 2 fathoms (3^m7) over it, lies about 2 cables north-westward of Secca Marmi light-beacon (*Lat.* $45^{\circ} 09' N.$, *Long.* $13^{\circ} 34' E.$).

The passage between Secca Sasso and Secca Marmi lies in the sector of Isolotto Galiner light between bearings of from 049° to 064° . Fontane church in line with Scoglio Orlandin, bearing about 037° , leads midway between these two shoals and about 2 cables south-eastward of Secca Campanile.

Scoglio Orlandin, 19 feet (5^m8) high, bare and of a grey colour, lies about 3 cables north-westward of Isolotto Galiner, page 476.

Secca Marmi Grande, the outermost of the dangers off-lying this part of the coast, has a least depth of $1\frac{1}{4}$ fathoms (3^m2) over it, and is situated from 5 to $6\frac{1}{4}$ cables north-north-westward of Secca Marmi light-beacon. The north-western side of the shallowest part of this shoal is marked by a red buoy surmounted by two red balls.

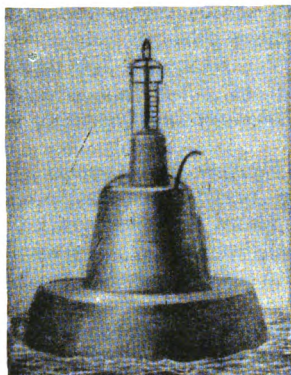
Isolotto Galiner light-structure in line with the castle at Orsera, bearing about 106° , leads northward of Secca Marmi Grande. The passage between Secca Marmi Grande and Scoglio Orlandin lies in the sector of the light on Isolotto Galiner, between bearings of from 099° to 116° .

Light.—A light is exhibited, at an elevation of 39 feet (11^m9), from a mast on a white iron tower on a concrete base, 42 feet (12^m8) in height, on Secca Marmi.

Charts 201, 1440, 2158a.

Chart 1559, plan of approaches to Ports Fontane and Orsera.

Outlying buoys.—A can-buoy, "A", painted in black and white chequers, and surmounted by a staff and globe, is established at a distance of about $5\frac{1}{2}$ miles west-north-westward of Secca Marmi light-beacon. For outlying buoys midway between the coasts of Istria and Italy, see page 554.



Secca Marmi light-beacon.

Porto di Orsera.—Isolotto San Giorgio, 118 feet (36^m0) high, lies with its southern end about 4 cables northward of Punta Petolon, separated from the coast south-eastward by a narrow boat passage, in which there is a depth of about 3 feet (0^m9). Porto di Orsera is entered between the northern extremity of Isolotto San Giorgio and a point on the coast, about 2 cables north-eastward. This port is open north-westward but is partly sheltered by Isolotto Galiner, which lies in the

approach, about $1\frac{1}{2}$ cables northward of Isolotto San Giorgio; the former islet is 46 feet (14^m0) high, covered with vegetation and bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about a quarter of a cable wide. The white limestone formerly quarried and used in the buildings of Venice is found on Isolotto Galiner.

The town of Orsera, which contained about 1,850 inhabitants, in 1939, is situated on a steep hill on the north-eastern side of the port and is dominated by a castle at its northern end. See view facing this page.

Lights.—A light is exhibited, at an elevation of 67 feet (20^m4), from a red iron framework structure, 33 feet (10^m1) in height, with a hut at its base, on Isolotto Galiner.

A light is exhibited, at an elevation of 18 feet (5^m5), from a black iron column, 13 feet (4^m0) in height, on the molehead in Porto di Orsera (*Lat.* $45^\circ 09' N.$, *Long.* $13^\circ 36' E.$).

Anchorage.—Porto di Orsera affords shelter only to small vessels. The best anchorage is north-eastward of Isolotto San Giorgio, in depths of from 5 to 9 fathoms (9^m1 to 16^m5), mud, good holding ground, with a hawser ashore north-eastward. Here a vessel is partly sheltered south-westward by Isolotto San Giorgio.

Directions.—A vessel entering Porto di Orsera should pass northward of Isolotto San Giorgio and between that islet and Isolotto Galiner, avoiding the bank which extends southward of the latter.

Coast.—Beacon.—Valle Piova, exposed to westerly and north-westerly winds and sea, lies at the southern end of a bay which is entered between the north-eastern entrance point of Porto di Orsera and Punta Sipera, about 8 cables northward. Two small moles project from the southern side of Valle Piova in the vicinity of a quarry, situated a short distance inland. The shores of the bay, northward of the head of Valle Piova, are indented and bordered by a shallow bank which is as much as 4 cables wide in places. This part of the bay is occupied by several islets lying on the shore bank. Isolotto Salomon,



Secca Marmi I. Tondo
Lt. beacon
(replaced by new
structure, 1923).

I Tuffo.

Fondane church,
in line with
Scoglio Orlandini,
bearing 037°.

Secca Sasso I. San Giorgio. I. Lunga.
beacon.
I. Galiner.

Orsera.

Approach to Porto di Orsera from south-westward.

(Original dated 1910.)

Chart 1559, plan of approaches to Ports Fontane and Orsera.

46 feet (14^m0) high, the largest of these islets, lies with its northern end about a cable southward of a projection situated about 3 cables south-eastward of Punta Sipera. Isolotto Burgamo lies close off the south-eastern end of Isolotto Salomon, and Scoglio Verlusa lies close off the south-western extremity of the same islet. These three islets form the northern side of Valle Piova. For anchorage, *see* page 478. 5

Isolotto Fighere (Figure) lies on a shallow bank which extends about 1½ cables off the projection just mentioned, and Valle Canella, with Casa Valcanella at its head, lies on the northern side of this projection. 10 Isolotto Tuffo lies on the outer end of a shallow bank which extends 1½ cables west-south-westward from Punta Sipera.

Valle Sipera, unsuitable for anchorage, is entered between Punta Sipera and Punta Fontane, about half a mile north-westward. Isolotto Riso lies on a shallow bank extending about 1½ cables off the north-eastern side of this cove. Isolotto Rovera, 58 feet (17^m7) high, lies on a shallow bank which extends about 4 cables off Punta Fontane; this islet is covered with shrubs and has a rocky slope at its north-western end. A 3-fathom (5^m5) patch lies near the end of a shoal, with depths of less than 5 fathoms (9^m1) over it, which extends about 20 2 cables westward of Isolotto Rovera.

Porto Fontane is entered between Isolotto Rovera and Punta Bassolini, about half a mile north-north-eastward. This port is open westward and is bordered by a bank, with depths of less than 3 fathoms (5^m5) over it, which extends 4 cables from its head; on this bank there are several rocks both above-water and sunken. A detached rocky shoal, with a depth of 2 fathoms (3^m7) over it, lies near the middle of the port about a quarter of a mile south-south-eastward of Punta Bassolini, and a rocky shoal, with a least depth of 4½ fathoms (8^m2) over it, lies from 2 to 3 cables south-westward of the same point. On the southern side of the port, a sunken rock lies near the edge of the bank which connects Punta Fontane with Isolotto Rovera; the western side of this rock is marked by an iron pole beacon, about 22 feet (6^m7) high, painted in red and white stripes and surmounted by a red ball. There is no passage between this beacon and Punta Fontane. Two small moles project from the southern side near the head of the port. The village of Fontane, in which there is a conspicuous church, lies about 7 cables east-south-eastward of Punta Fontane, and the Cemetery chapel (Friedhof) is situated on the eastern side of the port, about 4 cables northward of the church. For anchorage, *see* page 478. 40

Off-lying islets and dangers.—Beacon.—Isolotto Calle, surrounded by a shallow bank, the extent of which can best be seen on the chart, lies about 2½ cables south-westward of Isolotto Fighere. Isolotto Tondo Grande, 43 feet (13^m1) high, lies about 3 cables west-north-westward of Isolotto Calle; there is a rocky shoal, with a depth of 2 fathoms (3^m7) over it, midway between these two islets. Isolotto Tondo Piccolo, 31 feet (9^m4) high, lies about 2½ cables north-north-westward of Isolotto Tondo Grande; both these islets are covered with shrubs. 45

Isolotto Reverol (*Lat.* 45° 11' N., *Long.* 13° 35' E.), low and of a whitish colour, lies about 2½ cables south-westward of Isolotto Rovera. A shoal, with a depth of 1½ fathoms (2^m3) over it, lies a short distance northward of Isolotto Reverol, and another shoal, with a depth of 2½ fathoms (4^m6) over it, rock, lies about 2 cables westward of the same

Charts 201, 1440, 2158a.

Chart 1559, plan of approaches to Ports Fontane and Orsera.

islet. A $3\frac{1}{2}$ -fathom (6^m4) rocky patch, the outermost of the dangers in the western approach to Porto Fontane, lies about three-quarters of a mile west-north-westward of Isolotto Rovera.

- 5 Secca Benvegnuta, which breaks, lies from $2\frac{1}{2}$ to 4 cables westward of Punta Bassolini; an iron pole beacon, about 21 feet (6^m4) high, painted in black and red stripes, and surmounted by a black ball, marks the northern part of Secca Benvegnuta. A shoal, with a depth of 4 fathoms (7^m3) over it, lies midway between Secca Benvegnuta and the $3\frac{1}{2}$ -
10 fathom (6^m4) patch, just mentioned. The tower on Isolotto San Nicolo, off Parenzo (chart 201), in line with Isolotto Altese light-structure, bearing about 021° , leads westward of these dangers.

Anchorage.—In Valle Piova there is anchorage for small vessels northward of the quarry, in depths of from 7 to 9 fathoms (12^m8 to $15\ 16^m5$), sand and mud, good holding ground.

In Valle Canella, there is anchorage for small vessels, with local knowledge.

- In Porto Fontane, there is anchorage for small vessels, in a depth of about 4 fathoms (7^m3), about $1\frac{1}{2}$ cables from the southern shore,
20 sheltered from all but westerly winds, with the Cemetery chapel bearing 090° and Punta Fontane in line with the western extremity of Isolotto Tondo Piccolo bearing about 218° .

- Coast.—Islets and dangers.**—Valle Sabbion, unsuitable for anchorage, lies on the north-western side of Punta Bassolini; Isolotto
25 Santa Brigida lies about three-quarters of a mile west-north-westward of the same point. A shallow bank extends about three-quarters of a cable off the south-western end of this islet.

Chart 201.

- Isolotto Santa Brigida consists of two hills, covered with vegetation,
30 united by a low, bare tongue of land; it is connected to the coast, about 3 cables eastward, by a shallow bank. Scoglio Bianco lies on this bank midway between the islet and the coast.

- Punta Grossa, rocky, steep and sparsely covered with shrubs, lies about three-quarters of a mile north-westward of Punta Bassolini; a
35 rock, which uncovers, lies close offshore at a short distance southward of Punta Grossa (*Lat. $45^\circ 12' N.$, Long. $13^\circ 35' E.$*).

- Isolotto Altese, low and bare, lies near the north-western end of a shallow bank, about half a mile westward of Punta Grossa; Scoglio Orada, about 2 cables south-eastward of Isolotto Altese, lies on the
40 south-eastern end of the same bank. A rock, with a depth of less than 6 feet (1^m8) over it, lies about 2 cables south-westward of Scoglio Orada, and a 6-fathom (11^m0) patch lies about the same distance farther south-westward. A shoal, with a depth of 2 fathoms (3^m7) over it, lies about 2 cables westward of Punta Grossa and the same distance
45 northward of Scoglio Orada. Isolotto Altese and the dangers eastward of it, just mentioned, are covered by the *red* sector of the light on Scoglio Barbaran between bearings of from 011° to 062° .

- Porto Molin di Rio is entered between Punta San Pietro about half a mile north-north-eastward of Punta Grossa, and a point about
50 2 cables farther northward. Access to this port is rendered difficult by Scoglio Zantolo, which lies near the middle of a shallow bank, about 2 cables westward of Punta San Pietro; the bank is about 3 cables long and there is an above-water rock near each end of it. There is anchorage for small vessels, with local knowledge, sheltered

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To face page 479.



S. Luliano.

Parenzo
church.

Scoglio
Barbaran.

Casa
Vegettisi.

Lighthouse.

Scoglio
Calabio.

Porto di Parenzo and Scoglio Barbaran, bearing 130°, distant 1½ miles.

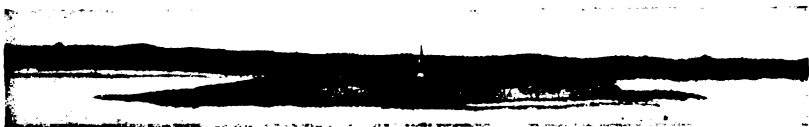
(Original dated 1898.)

Chart 201.

from both Bora and Scirocco, northward of the house on Punta San Pietro, in a depth of $4\frac{1}{2}$ fathoms (7^m8), hard mud, good holding ground.

Punta Brullo (Brulo), with a cove of the same name north-eastward of it, lies about a mile north-north-eastward of Punta Grossa. Scoglio Regata, low and bare, lies about 3 cables west-south-westward of Punta Brullo.

Light.—A light is exhibited, at an elevation of 30 feet (9^m1), from a red iron framework structure with white bands and a tank at its base, 20 feet (6^m1) in height, on Isolotto Altese (*Lat.* $45^\circ 12' N.$, *Long.* $13^\circ 34' E.$).



Isolotto Altese, bearing 090° , distant about $1\frac{1}{2}$ cables.

(Original dated 1939.)

Chart 1559, plan of Port Parenzo.

PORTO DI PARENZO.—Punta San Lorenzo, at the head of Porto di Parenza, lies about 6 cables northward of Punta Brullo. The harbour is formed by Scoglio Sarafel, about $1\frac{1}{2}$ cables south-westward of Punta San Lorenzo, and Isolotto San Nicolo, about a cable farther west-north-westward, on its south-western side; and the tongue of land on which the town of Parenzo stands, with Scoglio Barbaran, about $1\frac{1}{2}$ cables off its western extremity, on its north-eastern side. The entrance is about a cable wide between a breakwater extending north-north-eastward from the northern extremity of Isolotto San Nicolo and Scoglio Barbaran. See view on chart 1559, and view facing this page.

For vessels drawing not more than 15 feet (4^m6), Porto di Parenzo affords the best shelter on the western coast of Istria, but for larger vessels it is not so good.

Winds and precipitation are less heavy in the neighbourhood of Parenzo than in Golfo di Trieste and southward of Rovigno. The Scirocco tends to blow violently more frequently than the Bora, especially in the autumn and spring; strong and stormy south-westerly winds of short duration often interrupt the Scirocco, with a very high sea.

Both sides of Porto di Parenzo are bordered by shallow banks and depths of less than 3 fathoms (5^m5) extend about 2 cables from the head of the harbour. Two small breakwaters project towards one another from Scoglio Sarafel and Isolotto San Nicolo, leaving a narrow, shallow boat channel.

Isolotto San Nicolo, 80 feet (24^m4) high, is wooded and has on it a building and the conspicuous ruin of a round tower. This islet is connected by a shallow flat with Scoglio Calbula, half a mile north-westward of it; this flat extends about half a cable north-westward of Scoglio Calbula and its northern edge then trends $1\frac{1}{2}$ cables eastward to the breakwater. Scoglio Calbula and the flat extending westward of it, also the northern part of the bank on the eastern side of the

Charts 1440, 2158a.

R*

Chart 1559, plan of Port Parenzo.

breakwater, are covered by the *red* sector of the light on Scoglio Barbaran between bearings of from 011° to 062° . There is a small boat harbour on the eastern side of Isolotto San Nicolo a short distance south-eastward of the root of the breakwater.

Scoglio Barbaran is surrounded by a narrow shallow bank ; there is a passage between this rock and the peninsula east-south-eastward, in the fairway of which there are depths of about $3\frac{1}{2}$ fathoms (5^m9), but it is not recommended on account of the strong currents.

- 10 The southern side of the town is quayed. A conspicuous hotel stands on a projection, alongside which there are depths of 17 feet (5^m2), at the western end of the quay. Molo Nazario Sauro, with depths of from 13 to 10 feet (4^m0 to 3^m0) along both sides, projects a short distance south-south-westward from the quay, about a cable eastward of the hotel. There are depths of from about 6 to 10 feet (1^m8 to 3^m0) alongside the quay westward of this mole and about 10 feet (3^m0) alongside the quay eastward of the mole for a distance of about half a cable, whence the depths gradually decrease. Casa Vergottini stands at the head of the harbour, about $1\frac{1}{2}$ cables south-eastward of Punta San Lorenzo. There is a conspicuous gasometer about half a mile east-north-eastward of Scoglio Barbaran.

Danger.—Beacon.—Secca Beccherie, with a depth of 5 feet (1^m5) over it, lies, in the southern approach to Porto di Parenzo, about $4\frac{1}{2}$ cables southward of the tower on Isolotto San Nicolo and 4 cables offshore. This shoal is marked by an iron pole beacon, 10 feet (3^m0) high, painted in red and black stripes and surmounted by a red ball.

Lights.—A light is exhibited, at an elevation of 30 feet (9^m1), from a red pyramidal iron tower on a stone base, painted with black bands, 28 feet (8^m5) in height, on Scoglio Barbaran (*Lat.* $45^{\circ} 14' N.$, *Long.* $13^{\circ} 35' E.$).

A light is exhibited, at an elevation of 23 feet (7^m0), from a cylindrical masonry hut with a black cupola, 20 feet (6^m1) in height, on the head of the breakwater extending from the northern end of Isolotto San Nicolo.

A light is exhibited, at an elevation of 16 feet (4^m9), from a white stone column, 13 feet (4^m0) in height, on the head of Molo Nazario Sauro.

Anchorage.—Large vessels can anchor westward or north-westward of Scoglio Barbaran, in depths of from 12 to 13 fathoms, mud, good holding ground.

Small vessels can anchor in the harbour, in depths of from 2 to 5 fathoms (3^m7 to 9^m1), mud, not particularly good holding ground. A heavy sea is caused by southerly and north-westerly winds. Small vessels can also moor in the middle of the harbour south-south-westward of the mole.

Prohibited anchorage.—Anchorage is prohibited in the entrance to the port, on an imaginary line between the hotel and Isolotto San Nicolo, marked by two posts surmounted by anchors.

50 **Town.—Port facilities.**—The ancient town of Parenzo, which contained about 3,300 inhabitants, in 1939, stands on a low peninsula on the north-eastern side of the harbour. It has a large church, a basilica of the time of Justinian (A.D. 540), which is one of the oldest churches in existence, and an old convent, near which there is a

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Chart 1559, plan of Port Parenzo.

conspicuous round tower. Parenzo is the see of a bishop. The climate is mild and healthy.

Parenzo is connected to the general railway system.

There is frequent communication with Trieste, Pola and other 5 ports on the western coast of Istria.

Fresh provisions can be obtained in small quantities. Water is laid on to Molo Nazario Sauro.

There is a small hospital in the town.

Chart 201.

10

COAST.—Dangers.—Beacon and buoy.—Between Parenzo (*Lat.* 45° 14' N., *Long.* 13° 35' E.) and Punta Saltarel, about 3 miles northward, the coast is low and indented by coves, the shores of which are bordered by shallow banks. The extent of these banks can best be seen on the chart. Punta Pizzale lies about half a mile northward of 15 Parenzo, with Valle Peschiera between. A rocky shoal, with a depth of 1½ fathoms (2^m3) over it, lies about 2 cables north-westward of Punta Pizzale. Secca Ambolizzo, with a depth of 1½ fathoms (2^m3) over it and steep-to, lies about three-quarters of a mile north-westward of the same point and half a mile off Punta San Martino (Maturaga), 20 north-eastward. Secca Ambolizzo is marked by an iron beacon, 23 feet (7^m0) high, painted in red and black bands and surmounted by a ball. This shoal is covered by the *red* sector of Scoglio Barbaran light between bearings of from 153° to 308° and by the *red* sector of Punta del Dente light between bearings of from 325° to 018°. The 25 lighthouse on Punta del Dente, bearing more than 356° and well open of Punta Bossolo leads westward of this shoal.

Punta Raguzzi (Cervera) lies about 1½ miles north-north-westward of Punta Pizzale. Porto Bossolo lies between Punta Raguzzi and Punta Bossolo (*Lat.* 45° 16' N., *Long.* 13° 34' E.), half a mile north- 30 ward; Punta Saltarel lies about a mile north-north-eastward of the latter point.

Porto Cervera is entered between Punta Saltarel and Punta del Dente, about 1½ miles north-north-westward. Two rocky spits extend from Punta Saltarel and protect this harbour south-westward. Secca 35 Civran, with a depth of 1½ fathoms (2^m7) over it, lies near the end of the spit which extends about a mile west-south-westward of Punta Saltarel; Secca di Mezzo, a reef, about half a mile long, with an above-water rock on it, lies between Secca Civran and Punta Saltarel. Secca Erba, a reef with a 2-foot (0^m6) high rock on it, lies near the 40 middle of the spit extending about three-quarters of a mile west-north-westward of Punta Saltarel.

Secca Civran is marked on its south-western side by a conical buoy, painted in red and white stripes and surmounted by a red ball. Punta Saltarel and the dangers westward of it are covered by the *red* sector 45 of the light on Scoglio Barbaran bearing more than 153° and by the *red* sector of the light on Punta del Dente between bearings of from 325° to 018°.

The shores of Porto Cervera are bordered by a narrow shallow bank and at its head, Vallenga lies on the southern side and Valle Santa 50 Marina on the northern side. The village of Cervera Grande lies at the head of Vallenga, where there are two small moles, and there is a building, formerly the Health office, on the point between the two

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Chart 201.

creeks. The chapel of Santa Anna lies about half a mile south-westward of Cervera Grande and the village of Cervera (Castell Cervera) stands about 3 cables farther southward.

- 5 **Anchorage.—Directions.**—There are depths of from 8 to 10 fathoms (14^m6 to 18^m3), soft mud, good holding ground, near the head of Porto Cervera, where there is anchorage for small vessels, sheltered from all but north-westerly winds, with the former Health office, bearing 100° , and Santa Anna chapel in line with the houses in the village
10 of Cervera, bearing about 173° ; there are boulders ashore available for hawsers.

- When entering this harbour the southern point should be given a wide berth and the northern side kept aboard. When approaching from the southward a vessel should keep westward of the line Casa
15 Filippini, on the northern side of Porto Quieto, in line with Punta del Dente, bearing 014° , until the rock on Secca Erba is in line with Santa Anna chapel, bearing 133° , course may then be altered into the harbour.

Chart 1559, plan of Port Quieto.

- 20 **Porto Quieto.—Beacon.**—Porto Quieto is entered between Punta del Dente (*Lat. $45^\circ 18' N.$, Long. $13^\circ 34' E.$*) and Punta Vescovo, eastward of which stands the town of Cittanova (Cittanuova), about $1\frac{1}{4}$ miles north-westward, and gradually decreases in width towards Val di Torre at its head.

- 25 The hilly southern shore of Porto Quieto is partly cliffy and forms Valetta (Dente bay) about three-quarters of a mile within the entrance. A bank, with depths of less than 5 fathoms (9^m1) over it, extends three-quarters of a cable north-westward from Punta del Dente; thence the coast is almost steep-to as far as Punta Grossa, about a mile
30 east-north-eastward of Punta del Dente. There are extensive quarries on this side of the bay. The village of Bernazza lies a short distance inland, about $1\frac{1}{4}$ miles east-north-eastward of Punta del Dente, and the ruins of Santa Croce chapel stand about 3 cables farther east-north-eastward.

- 35 On the northern side, the coast slopes gently and, as far as Punta San Pietro, situated about a mile eastward of Punta Vescovo, is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, which is as much as $2\frac{1}{4}$ cables wide off the latter point. An iron pole beacon, 23 feet (7^m0) high, painted in red and white stripes, and sur-
40 mounted by a red ball, stands about three-quarters of a cable westward of Punta Vescovo. There are cliffs for a short distance westward of Punta San Pietro, and between that point and the chimney of the brickworks, about 4 cables east-north-eastward, there are steep reddish cliffs. Close off the brickworks is the mouth of Fiume Quieto, between
45 a point projecting east-north-eastward and the western end of a stone dyke which extends about half a mile westward from the eastern entrance point of Valle Quieto, separating the swamps at the river mouth from the bay.

- There is a depth of less than 3 feet (0^m9) over the bar of Fiume
50 Quieto and, within, there is a channel about 20 feet (6^m1) wide, in which there are depths of about 6 feet (1^m8). The river is navigable for a distance of $6\frac{1}{4}$ miles from its mouth. Valle Quieto, through which the river flows is visible from a great distance. The coast eastward of the dyke is steep; see view on chart 1559.

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Chart 1559, plan of Port Quieto.

Between Punta San Pietro and Punta Grossa, the depths in the bay, eastward, decrease rapidly. A shallow bank of mud extends about 3 cables southward of the dyke; on the southern side of this mud-bank, a narrow channel, in the fairway of which there are depths of about $1\frac{1}{2}$ fathoms (2^m7), leads to the head of Val di Torre where there is a Health office and, on the southern side, a small quay and a wooden jetty for loading bauxite.

Currents setting out of this bay are frequently noticeable in the neighbourhood of Punta del Dente and between Secca di Val and Cittanova; their strength and direction are influenced by the prevailing winds and rainfall; that from the river colours the water a light green, and now and then reaches some miles seaward.

Dangers.—Buoy.—Secca di Val, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, lies about half a mile west-south-westward of Cittanova; depths of less than 5 fathoms (9^m1) extend $2\frac{1}{2}$ cables northward, about 2 cables southward and 2 cables eastward of this shoal. Secca di Val is covered by the red sector of the light on the head of the western breakwater at Cittanova, between bearings of from 025° to 058°. A buoy, painted in red and black stripes, and surmounted by a red ball is moored near the centre of Secca di Val.

Secca Quieto, with a depth of $4\frac{1}{2}$ fathoms (8^m7) over it, rock, lies about half a mile eastward of Secca di Val, and from 2 to 3 cables southward of Cittanova. This shoal is covered by the green sector of the light on the head of the western breakwater at Cittanova, between bearings of from 008°, through north, to 300°.

Punta San Pietro in line with the dwelling houses of the brickworks, bearing 072°, leads southward of Secche di Val and Quieto.

Light.—A light is exhibited, at an elevation of 36 feet (11^m0), from a tower on an angle of a white dwelling, 23 feet (7^m0) in height, situated on Punta del Dente about 65 yards (59^m4) from its western extremity (*Lat.* 45° 18' N., *Long.* 13° 34' E.).

Anchorages.—Porto Quieto affords good anchorage for vessels of any size, sheltered from all but westerly winds; these cause a considerable sea, which is, however, never dangerous, and a vessel

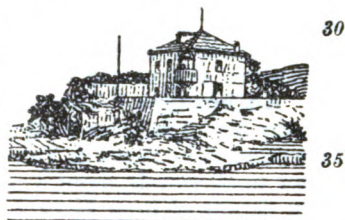
parting her cable would be driven on to the soft mud at the head of the bay. The Bora often blows strongly out of Valle Quieto, but never so hard as in Golfo di Trieste.

Steamers of 7,000 tons, drawing 26 feet (7^m9), call at Porto Quieto to load bauxite, which is brought off in lighters from the pier at the head of Val di Torre.

The best anchorage for a large vessel is in the approach to Valetta, about 3 cables offshore, in depths of from 9 to 10 fathoms (16^m5 to 18^m3).

The head of Val di Torre affords security to small craft, which can anchor off the quay in a depth of $1\frac{1}{2}$ fathoms (2^m3), but the holding ground is not so good here as elsewhere; there is also anchorage, in a depth of $1\frac{1}{2}$ fathoms (3^m2), in the outer part of this cove.

There is a mooring buoy off Punta San Pietro and another north-eastward of Valetta.



Punta del Dente lighthouse.

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Chart 1559, plan of Port Quieto.

In former days, Venetian men-of-war landed or embarked their guns and heavy stores at Porto Quieto when the weather did not permit of their lying safely off Porto di Malamocco, page 584.

- 5 **Porto di Cittanova.**—This port is situated on the northern side of the town of Cittanova and on the southern side of a bay which is entered between Punta Vescovo and Punta Carpignano, about 4 cables north-westward. This bay is open westward and its shores are bordered by a shallow bank, the extent of which can best be seen on
10 the chart; on the northern side of the bay, and between the breakwater and the mole, the shorebank is rocky.

- A breakwater extends about a cable north-north-westward from Punta Vescovo. About $1\frac{1}{2}$ cables north-eastward of the breakwater, a mole projects a short distance offshore; there are depths of $3\frac{1}{2}$
15 fathoms (5^m9) at the head of this mole, and about $2\frac{1}{2}$ fathoms (4^m6) along its north-eastern side. Alongside the quay which extends a short distance eastward of the root of this mole, there are depths of 2 feet (0^m6). A boat harbour, protected westward by a small mole, and with a maximum depth of 6 feet (1^m8) in it, is situated about a
20 cable south-eastward of the mole just mentioned.

The town of Cittanova contained about 1,600 inhabitants, in 1939. The campanile of the cathedral in the town is white and conspicuous; see view on chart 1559.

- Lights.**—A light is exhibited, at an elevation of 25 feet (7^m6), from
25 an octagonal white tower, on the head of the breakwater at Cittanova (Lat. $45^\circ 19' N.$, Long. $13^\circ 34' E.$).

A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron column, 16 feet (4^m9) in height, on the head of the principal mole at Cittanova.

- 30 A light is exhibited, at an elevation of 16 feet (4^m9), from a black iron column, 15 feet (4^m6) in height, on the head of the mole on the western side of the entrance to the boat harbour at Cittanova.

- Anchorage.**—There is a small space for anchorage, in depths of from 3 to 5 fathoms (5^m5 to 9^m1), mud or sand, partly sheltered south-
35 westward by Secca di Val. Within the breakwater, there is anchorage for small vessels about a cable offshore northward of the boat harbour, in depths of from $1\frac{1}{2}$ to 2 fathoms (2^m7 to 3^m7), sand and mud, good holding ground.

Chart 201.

- 40 **Out-lying buoy.**—A can-buoy, "B," painted black and white, and surmounted by a ball, is established at a distance of about $4\frac{1}{2}$ miles west-north-westward from the light-tower on the head of the breakwater at Cittanova.

- Coast.**—**Buoy.**—Between Cittanova and Umago, a town, about
45 7 miles northward, the coast is clear of off-lying dangers except for a rocky shoal, with a depth of 6 fathoms (11^m0) over it, which lies about 6 cables west-south-westward of Punta Daila. This stretch of coast is low and indented by several small bays, the majority of which are unsuitable for anchorage.

- 50 Punta Castagneda lies about three-quarters of a mile north-westward of Punta Carpignano, with Valle Muiella (Mujella) between; depths of less than 5 fathoms (9^m1) extend about 3 cables off the former point. Punta Daila lies about $1\frac{1}{2}$ miles northward of Punta Castagneda.

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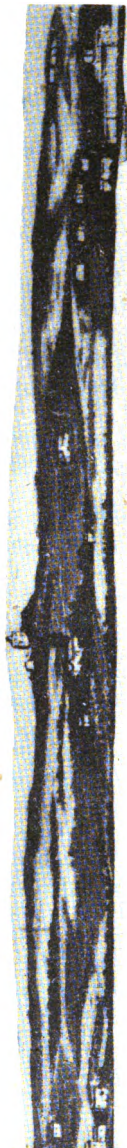
*Verlenglio church.
Casa Punta,
bearing about 076°.*

*Porto di
Daila.*

Entering Porto di Daila.
(Original dated 1910.)

*Casa Businia,
bearing about 100°.*

Tower.



Casa Saini.

Daila.

Entering Porto di Daila.
(Original dated 1910.)

Chart 201.

A reef, the inner part of which is nearly awash and with a depth of less than 5 fathoms (9^m1) at its outer end, extends about half a mile north-westward of Punta Daila. A buoy, painted in red and white stripes and surmounted by a red ball, is moored, in a depth of 13 feet (4^m0), on the northern side of this reef, about 3½ cables north-westward of Punta Daila.

Porto di Daila, the principal bay in this stretch of coast, is entered between Punta Daila and Punta Comune, about half a mile north-north-eastward. It affords anchorage to small vessels, sheltered from the Bora and Scirocco, in a depth of about 4 fathoms (7^m3), mud, good holding ground, but exposed to westerly winds; its sides are bordered by a narrow, shallow bank and depths of less than 1½ fathoms (2^m7) extend about 3 cables off its head. A mole, at the head of which there is a depth of 13 feet (4^m0), projects a short distance from the northern side of the bay. On the southern side, there is a conspicuous convent and a group of cypress trees; two landing jetties project near the convent. There is a mooring buoy in the bay.

Casa Saini, about three-quarters of a mile eastward of Punta Daila; Casa Businia (Bosonia), about 1½ miles farther south-eastward; Casa Punta, about 1½ miles north-eastward of Punta Daila; and the campanile of the village of Verteneglio, about 2½ miles farther east-north-eastward are conspicuous. *See* views facing this page.

Approaching from southward, a vessel should pass westward of the reef off Punta Daila, in a depth of 8 or 9 fathoms (14^m6 or 16^m5), and, passing northward of the buoy, enter midway between the northern and southern entrance points, with Casa Saini in line with Casa Businia, bearing 111°; or with Casa Punta in line with the campanile in Verteneglio, bearing 073°. Vessels anchor northward of the convent.

Light.—A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 16 feet (4^m9) in height, on the molehead at Porto di Daila (*Lat.* 45° 22' N., *Long.* 13° 33' E.).

Coast.—**Anchorage.**—Punta Molino, on which are the ruins of a windmill, lies about a mile northward of Punta Comune. Valle San Lorenzo is entered between Punta Molino and Punta Saltarella, about three-quarters of a mile northward. On the north-eastern side of this cove are the village of San Lorenzo, with a church, and a small mole, with a depth of 6 feet (1^m8) alongside.

In a Bora, large vessels can anchor in a depth of about 13 fathoms (23^m8), mud, off Valle San Lorenzo, with Punta Molino, bearing 091°, distant about 2½ miles.

Punta delle Vacche lies about 4½ miles north-north-westward of Punta Saltarella. The coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about 2½ cables wide at a short distance northward of Punta delle Vacche; Secca Fiandara, with a depth of 3 feet (0^m9) over it, lies near the middle of the coastal bank, about 3 cables northward of this point, and on the southern side of Valle Pozzuoli. This cove is shallow and is situated between Punta delle Vacche and Punta Muiella (Mujella), about three-quarters of a mile north-north-eastward.

Chart 1559, plan of Port Umago.

Depths of 3 fathoms (5^m5) and less extend 2½ cables westward of Punta Muiella; the light on the outer molehead at Umago is not visible over this portion of the shore bank.

Charts 1440, 2158a.

Chart 1559, plan of Port Umago.

Porto di Umago.—Dangers.—Buoyage.—Porto di Umago is formed between the town of that name, situated 3 cables northward of Punta Muiella, and Punta Pegolotta, about 6 cables farther north-
5 north-westward. Secca San Martino, with a curved mole on it, extends about 2 cables north-westward from the western end of the town, and from the northern side of the port, Secca dei Greci, on which there are several reefs, extends about 2 cables southward towards the head of the mole; the southern side of Secca dei Greci is marked by a white
10 conical masonry beacon, 10 feet (3^m0) high, situated, in a depth of 8 feet (2^m4), about a cable north-westward of the molehead (*Lat.* 45° 26' N., *Long.* 13° 31' E.).

Secca Pegolotta, with a depth of less than 6 feet (1^m8) over it, extends about 2½ cables westward of Punta Pegolotta. The outer
15 end of this reef is marked by a light-beacon and depths of less than 5 fathoms (9^m1) extend 2½ cables westward of the light-beacon; thence the 5-fathom (9^m1) line trends south-eastward across the entrance to the port.

The entrance lies between the head of the mole and the beacon on
20 Secca dei Greci, and is marked by two conical buoys, about 33 yards (30^m2) apart, moored half a cable westward of the molehead. The northern of these buoys is painted red and surmounted by a cylinder; the southern buoy is painted black and surmounted by a cone. There is a least depth of 9 feet (2^m7) in the entrance; within, the depths
25 increase. A black conical buoy, surmounted by a cone, is moored, in a depth of about 2 fathoms (3^m7), three-quarters of a cable east-north-eastward of the molehead, off the north-eastern end of Secca San Martino. The bottom is rocky near the entrance, but soft mud within. The port is bordered by a narrow bank, with depths of less
30 than one foot (0^m3) over it. On the northern side, there are two landing piers in shallow water.

The town of Umago, which contained about 2,400 inhabitants, in 1939, stands on the southern side of the port. The town is fronted by Riva V Novembre, from the middle of which, a mole, with a depth
35 of 10 feet (3^m0) at its head, extends northward for a short distance.

Conspicuous objects are: the campanile in the town; Casa Polesina, about 6½ cables east-north-eastward of the outer molehead; and Casa Carminati, on the foreshore about 2½ cables west-south-westward of Casa Polesina.

40 **Lights.**—A light is exhibited, at an elevation of 36 feet (11^m0), from a red iron framework structure on a conical base, 38 feet (11^m6) in height, on Secca Pegolotta.

A light is exhibited, at an elevation of 26 feet (7^m9), from a wooden structure, 20 feet (6^m1) in height, on the head of the outer mole at
45 Umago.

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 15 feet (4^m6) in height, on the head of the small inner mole at Umago.

Anchorage.—Directions.—Large vessels can anchor, in a Bora,
50 off Valle Muiella, situated southward of Umago. The best berth is with the campanile in Umago, bearing 090°, and Secca Pegolotta light-beacon, bearing 348°, in a depth of 10 fathoms (18^m3), mud, good holding ground.

At night, there is anchorage, in a depth of about 14 fathoms (25^m6),

Charts 201, 1440, 2158a.

Chart 1559, plan of Port Umago.

about 2 miles westward of Umago, with Secca Pegolotta light bearing 063°.

These anchorages should be quitted on the setting in of southerly or especially south-westerly winds, on account of the high sea which they quickly raise. 5

A vessel entering Porto di Umago should pass between the buoys just outside the entrance, with Casa Carminati in line with Casa Polesina, bearing about 058°, and, after passing northward of the buoy marking the north-eastern end of Secca San Martino, can alter course as convenient for the anchorage. 10

Chart 201.

Coast.—Buoys.—Between Punta Pegolotta and Capo Salvore, about 3½ miles northward, the coast is low and indented with several small bays; of these Vallelunga and Val dei Carpani, situated 3 and 6 cables, respectively, northward of Punta Pegolotta, are unsuitable for anchorage. 15

A can-buoy, "C", painted black and white, and surmounted by a ball, is established at a distance of about 2 miles north-westward from the light-structure on Secca Pegolotta. 20

Chart 1434, Golfo di Trieste.

Valle di Scipar, about 1¼ miles northward of Punta Pegolotta, affords shelter to small vessels, with local knowledge, during northerly and north-easterly winds. In the middle of the entrance to this cove, there is a detached shoal, with a depth of 4 feet (1^m2) over it, about 2½ cables west-north-westward of the ruins of Scipar castle, which are situated on the foreshore of the south-eastern entrance point. A church and some houses stand at the head of the cove. 25

Scogliera Scipar, parts of which are at times uncovered, extend about half a mile south-westward from a point situated about a mile south-eastward of the light-tower on the western extremity of Capo Salvore. Secca Senestra, with a depth of one fathom (1^m8) over it, lies about 3 cables northward of the outer end of Scogliera Scipar, on the edge of the 3-fathom (5^m5) shore bank. A buoy, painted in red and white stripes and surmounted by a red tripod and ball, is moored, in a depth of 19 feet (5^m8), on the outer edge of Scogliera Scipar. These shoals are covered by the red sector of the light on Secca Pegolotta, bearing more than 165°. 35

Secca Scar, with a least depth of 4 fathoms (7^m3) over it, is situated about a mile south-westward of Capo Salvore light-tower, and from 6 to 9 cables offshore. 40

GOLFO DI TRIESTE.—General remarks.—Golfo di Trieste, the north-eastern portion or head of the Adriatic, is entered between Capo Salvore and Punta del Tagliamento (*Lat. 45° 38' N., Long. 13° 06' E.*), about 19 miles west-north-westward (*chart 201*). The city of Trieste lies at its eastern end. The bottom throughout is mud and clay, often rendering it difficult to weigh anchor; in no part, except close to Capo Salvore, does the depth exceed 13 fathoms (23^m8). See view facing page 489. 45

The south-eastern side of the gulf is indented and backed by cultivated hills of moderate elevation; the best anchorages are situated on this side. The northern side consists of the low beach of a marshy region, consisting of Laguna di Marano and Laguna di Grado, both of

Charts 201, 1440, 2158a.

Chart 1434, Golfo di Trieste.

which are intersected by numerous creeks. The north-eastern side is high and precipitous, and the coast line here is almost straight.

A vessel bound for Trieste should endeavour to make the coast of 6 Istria about Rovigno, the high campanile of which place may be seen for a considerable distance. The long flat on the northern side of the gulf near Grado, including Banco Mula di Muggia, should not be approached within a depth of 6 fathoms (11^m0).

South-eastern side of gulf.—Capo Salvore is a square-shaped 10 promontory, which forms the north-western extremity of the Istrian peninsula; it presents a front in that direction, about 1½ miles long, with three projections. Punta Lanterna, on which is Capo Salvore light-tower, is the south-westernmost of these projections and Punta Salvore, the north-easternmost, Punta di Mezzo lies midway between 15 these two. The cape is low and dark; it is dangerous to approach in foggy weather as there are several off-lying dangers which are steep-to. Vessels sometimes lie almost in a calm under Capo Salvore when the heaviest Bora is blowing in Golfo di Trieste.

Buoy.—In 1945, a buoy, No. 8, was established at a distance of 20 about 2½ miles west-north-westward of the light-tower on Capo Salvore.

Light.—A light is exhibited, at an elevation of 119 feet (36^m3), from a white circular tower, 95 feet (29^m0) in height, on Punta Lanterna, the western extremity of Capo Salvore (*Lat.* 45° 29' N., *Long* 25 13° 30' E.). See view on chart 1434.

Dangers.—There are several rocky shoals off-lying Capo Salvore, at a distance of from half a mile to one mile offshore, which should be avoided by a vessel of deep draught. Secca Scar, the southernmost of these dangers, is described on page 487.

30 Secca Or, with a depth of 4 fathoms (7^m3) over it, lies about 6 cables west-north-westward of Capo Salvore light-tower. Secca Gobbo, with a depth of 3½ fathoms (6^m4) over it, lies about 7 cables northward of Capo Salvore light-tower and 4½ cables offshore. Secca For, the outer and northernmost danger, with a depth of 4½ fathoms (7^m8) over it, 35 lies about a mile north-westward of Capo Salvore light-tower and the same distance offshore.

Coast.—**Light.**—**Beacon.**—Insenatura di Salvore, on the south-western side of Punta Salvore, is a place of refuge for small craft during offshore winds; south-westerly winds cause a surf.

40 The entrance, about 66 yards (60^m3) wide, is between the head of a mole, extending from the northern side, and a white, conical, masonry beacon, marking the end of a reef extending north-eastward from the southern side. There are depths of 13 feet (4^m0) in the entrance and 11 feet (3^m4) at the head of this mole. Within, there are depths of 45 1½ fathoms (2^m7), sand, good holding ground.

On the north-eastern side of the head of the bay there are some houses and a church.

A light is exhibited, at an elevation of 20 feet (6^m1), from a red iron column, 18 feet (5^m5) in height, on the head of the outer mole.

50 **Bala di Pirano.**—This bay is entered between Punta Salvore and Punta Madonna, about 2½ miles north-eastward. Although unprotected from the Bora, this bay affords the best anchorage on the coast of Istria, for sailing vessels unable to reach Trieste, or which, being driven by strong winds from that port, are obliged to bear up for 55 shelter.

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To face page 480.

Mt. Poggioreale.

Mt. Naus.



Miramare.

Trieste.

San Giacomo



Punta Sottile,
bearing 006°, distant
10 miles.

Punta Grossa.

Punta Romco. *Punta Madonna,*
Pirano.

View in 2 parts of entrance to Golfo di Trieste;
taken from a position 2 miles. 000° from Punta Salvore.

(Original dated 1910.)

Chart 1434, Golfo di Trieste.

This bay is backed by hills, which are highest on the north-eastern side. The south-western side is overgrown, rugged and not very high; near the middle of this side is the ruined church of San Pietro (*Lat. 45° 29' N., Long. 13° 33' E.*). At the head of the bay, Fiume Dragogna and Fiume Lera flow through level ground, where there are extensive salines. The coast in the neighbourhood of Pirano, on the north-eastern side of the bay, is hilly and cultivated; the heights are covered with olive and cypress trees.

In the north-eastern part of the bay, especially north-westward and eastward of Punta San Bernardino, about a mile south-south-eastward of Punta Madonna, the Bora blows less violently than at any other part of Golfo di Trieste. The Scirocco is seldom violent and raises no sea. Northerly and north-westerly winds, to which the bay is open, are seldom strong enough to cause a vessel to drag, and at worst she would only be driven on to the mud at the head of the bay. Westerly winds cause a considerable but not a dangerous sea. See view facing this page.

A 4-fathom (7^m3) bank extends about a cable south-westward of Punta Madonna.

Porto di Pirano, situated a quarter of a mile south-eastward of Punta Madonna, consists of an outer and inner harbour. The outer and larger harbour is protected by two moles, the northern mole extending south-westward, and the southern mole extending a short distance north-westward, leaving a very narrow entrance. There are depths of from 5 to 18 feet (1^m5 to 5^m5) in this harbour. A quay extends northward from the root of the southern mole as far as the inner harbour, which is entered from the northern end of the outer harbour, and in which there are depths of 6 feet (1^m8). A wooden pier, with a depth of 10 feet (3^m0) at its head, lies a short distance southward of these harbours.

A short wooden pier, with a depth of 4 feet (1^m2) at its head, extends southward of Punta San Bernardino. Near this point there is a village of the same name surrounding an old convent. Monte Mogoron, 300 feet (91^m4) high, stands about 4 cables north-north-eastward of Punta San Bernardino. At the head of a small bay eastward of this point, there is a seaplane station.

The village of Portorose, in which there were 390 inhabitants, in 1939, is fronted by a quay extending from about 4 to 6 cables eastward of Punta San Bernardino.

Valle di Fisine lies between the eastern end of the quay at Portorose and a point about three-quarters of a mile southward. On the northern side of this cove, there is a factory from which a short pier extends in a south-westerly direction. There is a depth of 16 feet (4^m9) at the head of this pier. A mooring buoy is laid off the pier and another pier extends offshore close south-eastward of the factory. On the south-eastern side of Valle di Fisine, there are salines. Torre Sezza stands on the southern entrance point (*Lat. 45° 30' N., Long. 13° 35' E.*).

Valle di Fasano, close to Torre Sezza, is surrounded by hills on which there are houses.

Valle di Sizziole is situated at the south-eastern end of Baia di Pirano; at the head of this cove are the mouths of Fiumi Lera and Dragogna. These rivers are only navigable by boats.

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Chart 1434, Golfo di Trieste.

Lights.—Fog signal.—A light is exhibited, at an elevation of 33 feet (10^m1), from a grey octagonal tower, 10 feet (3^m0) in height, on Punta Madonna (*Lat.* 45° 32' N., *Long.* 13° 34' E.).

- 5 In case of fog, the bell of the church near Punta Madonna light-tower is rung.

A light is exhibited, at an elevation of 21 feet (6^m4), from a red masonry hut, 25 feet (7^m6) in height, on the head of the western mole at Pirano.

- 10 A light is exhibited, at an elevation of 21 feet (6^m4), from a red masonry hut, 25 feet (7^m6) in height, on the head of the eastern mole at Pirano.

A light is exhibited, at an elevation of 28 feet (8^m5), from a red iron conical tower, 26 feet (7^m9) in height on Punta San Bernardino.

- 15 A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron column, 15 feet (4^m6) in height, on the head of the mole at Portorose.

A light for the use of aircraft is exhibited, at an elevation of 591 feet (180^m1), from the radio mast of Portorose.

- Anchorage.**—The best anchorage for a large vessel is between 20 Pirano and Punta San Bernardino, westward of Monte Mogoron, which affords shelter from easterly winds, at a distance of about 2½ cables offshore, in depths of from 8 to 9 fathoms (14^m6 to 16^m5), tenacious mud or clay; in other parts of the bay, the holding ground is not so good.

Small vessels can find shelter off Portorose.

- 25 In a Scirocco, vessels can find shelter south-westward of Pirano. With south-westerly winds vessels can anchor about half a mile off the south-western side of the bay, fairly good holding ground. The small bays at the south-eastern end of Baia di Pirano are unsuitable for anchorage.

- 30 **Prohibited anchorage.**—Anchorage is prohibited in an area in front of the seaplane station, the southern limit of which is marked by two buoys painted in red and white bands, except for vessels seeking refuge in bad weather; these vessels must quit the area when the weather moderates.

- 35 **Aeroplane exercises.**—The exercising of aeroplanes is signalled by a white and red ball displayed at Punta San Bernardino, and vessels in Baia di Pirano should then proceed at reduced speed and avoid the aeroplanes.

- Pirano.—Communications.**—The town of Pirano, which contained about 5,740 inhabitants, in 1939, lies northward and eastward of the harbour of that name. The campanile of San Giorgio church, on the northern side of the town, is conspicuous; it is situated at the edge of a containing wall resembling a viaduct. On the heights, eastward, are the ruins of an old castle.

- 45 Soap is manufactured and exported.

There is regular steamer communication with Trieste, Fiume, Zadar and other ports on the Istrian coast.

Portorose is connected to the general railway system.

- Coast.—Beacon.**—Between Punta Madonna and Punta Prete, 50 about 1½ miles east-north-eastward, there is a light; Val Fiesso, situated about three-quarters of a mile east-south-eastward of Punta Madonna, affords some shelter during southerly winds and, to small vessels that can anchor close offshore, during westerly winds. The bottom is mud, good holding ground.

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Chart 1434, Golfo di Trieste.

Valle di Strugnano, situated at the head of this bight, affords shelter to small vessels during southerly winds and also partly during a Bora, but is open to winds between north and north-west. There is a wooden pier in this cove, with a depth of about 10 feet (3^m0) at its head. There are salt beds close to the coast here.

Punta Ronco, high, cliffy and of a dark colour, lies about half a mile east-north-eastward of Punta Prete. An iron framework beacon (*Lat. 45° 32' N., Long. 13° 37' E.*), painted in black and white bands, stands on Punta Ronco; a shallow bank extends about a cable off this point.

Baia di Capodistria.—**Light-buoys.**—Baia di Capodistria is entered between Punta Ronco and Punta Grossa, about 4½ miles north-eastward, and is open westward. High lands rise close to the shore of this bay, except in the eastern part, where the land is level with salines. The bay is bordered by a bank, with a depth of less than 5 fathoms (9^m1) over it, which, off San Nicolo convent, situated on the north-eastern shore, about 1½ miles south-eastward of Punta Grossa, is about 3 cables wide. Fiume Risano flows into the head of the bay, between mudbanks, about half a mile north-eastward of the town of Capodistria. Valle di Stagnone and Valle Campi, both of which are shallow, lie southward and northward, respectively, of the mouth of this river. Monte Sermino stands, isolated, a short distance inland from the head of Valle Campi.

The bottom of Baia di Capodistria mostly consists of soft yellow mud.

A conical light-buoy, "D", painted black and surmounted by a cylinder, exhibiting a *white flashing* light *every four seconds*, is established at a distance of about 2 miles northward of Punta Ronco.

A shallow bank, which is steep-to, extends 1½ cables westward of Punta Grossa; the western edge of this bank is marked by a cylindrical light-buoy, painted in red and white bands and exhibiting a *red flashing* light *every five seconds*, duration of flash *half a second*. The bank is also covered by the *red* sector of the light on the quay in Valle San Bartolomeo, bearing less than 065°.

San Nicolo convent; the Sanatorium near the northern entrance point of Valle Campi; the yellow cliffs between the towns of Isola and Capodistria, situated on the southern side of the bay, 2 and 5 miles, respectively, eastward of Punta Ronco; and some ruins on the summit of Monte San Marco, about half a mile inland between these two towns, are conspicuous.

The town of Isola d'Istria, which contained about 6,777 inhabitants, in 1939, stands on a small peninsula joined to the mainland by a narrow strip of land. Punta Gallo forms the north-western extremity of this peninsula. The small harbour of Isola lies between two moles extending from the western side of the peninsula, the northern and shorter mole in a westerly direction and the southern in a south-westerly direction. These moles protect the harbour from all winds except those from north and north-west. There are depths of 13 feet (4^m0) along both sides of the northern mole and a similar depth at a distance of 66 yards (60^m3) off the southern side of the southern mole; on the southern side of the root of the latter mole, there is a small shallow basin. The bottom of the harbour consists of mud, good holding ground. The harbour of Isola d'Istria was reported, in 1945, to be considerably damaged.

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Chart 1434, Golfo di Trieste.

In the vicinity of Punta Villisan, situated about a mile eastward of Punta Gallo, two small moles project into a depth of about 3 feet (0^m9).

- 5 The town of Capodistria, which contained about 7,105 inhabitants, in 1939, stands on a rocky islet, a short distance offshore, and is connected to the mainland by a stone causeway; this town has a small harbour on its western side, accessible to vessels drawing not more than 10 feet (3^m0). The harbour is protected from all winds by Molo delle Galere, which is hook-shaped, and only strong westerly winds cause any sea. A quay extends a short distance southward of Molo delle Galere from which Pontile del Littorio projects, in front of the Health office; a mooring buoy is laid a short distance off the latter pier. There is a small basin close south-eastward of Pontile del
- 15 Littorio. On the northern side of the town, there are some shipyards for wooden vessels.

A vessel entering the harbour of Capodistria must avoid a shallow patch close off the head of Molo delle Galere.

- 20 On the north-eastern side of Baia di Capodistria, a small mole projects from the coast at Valdoltra, about 4 cables west-north-westward of San Nicolo convent. There is a marine hospital near this mole.

A mole projects south-westward from the coast in the vicinity of Ancarano, about half a mile south-eastward of San Nicolo convent.

- Lights.**—A light is exhibited, at an elevation of 23 feet (7^m0),
25 from a red iron column, 20 feet (6^m1) in height, on Punta Gallo (*Lat.* 45° 33' N., *Long.* 13° 39' E.).

A light is exhibited, at an elevation of 18 feet (5^m5), from a black iron column, 18 feet (5^m5) in height, on the head of the northern mole at Isola.

- 30 A light is exhibited, at an elevation of 17 feet (5^m2), from a grey iron column on the head of the southern mole at Isola.

A light is exhibited, at an elevation of 15 feet (4^m6), from a red iron column, 13 feet (4^m0) in height, on the head of Molo delle Galere at Capodistria.

- 35 A light is exhibited, at an elevation of 20 feet (6^m1), from a black iron column, 18 feet (5^m5) in height, on the head of Pontile del Littorio at Capodistria.

A light is exhibited, at an elevation of 18 feet (5^m5), from a red iron column, 18 feet (5^m5) in height, from the head of the mole at Valdoltra.

- 40 A light is exhibited, at an elevation of 15 feet (4^m6), from a black iron pillar, 13 feet (4^m0) in height, on the head of the mole near Ancarano.

- Anchorage.**—**Caution.**—Baia di Capodistria is not recommended as an anchorage as the holding ground is not good. The Bora is
45 more moderate than at Trieste; westerly and south-westerly winds cause a heavy and sometimes dangerous sea.

The best anchorage, in a Bora, is westward or south-westward of San Nicolo convent, in a depth of about 10 fathoms (18^m3); small vessels can anchor southward of this convent, in depths of from 4½ to 5½
50 fathoms (8^m2 to 10^m1). Anchoring along the southern side of the bay is to be avoided on account of northerly and westerly winds.

Small vessels can find shelter from southerly winds or in a Bora, which blows moderately here, westward or south-westward of Isola; the bottom is mud and tolerably good holding ground. Vessels may

Charts 201, 1440, 2158a.

Chart 1434, Golfo di Trieste.

anchor about half a mile westward of Isola in depths of from 7 to 9 fathoms (12^m8 to 16^m5), mud.

The coves under the town of Capodistria afford shelter to coasters and fishing boats, which also seek refuge from a gale in Valle di Stagnone.

Masters of vessels are cautioned that sunken fishing stakes may exist along the northern and eastern sides of the bay.

Communications.—Both Istria and Capodistria are connected to the railway system and have regular steamer communication with Trieste; the former town has steamer communication also with Pola.

Coast.—Buoy.—Valle San Bartolomeo is situated at the head of the promontory separating Baia di Capodistria from Baia di Muggia, between Punta Grossa and Punta Sottile, about a mile north-eastward. This bay is protected by high land. Both entrance points are bordered by shallow banks which extend about 1½ cables offshore. The bank extending from Punta Sottile is marked by a cylindrical buoy, painted in red and white bands and surmounted by a tripod with a ball top-mark; this shoal is covered by the red sector of the light on the quay fronting the Lazaretto, bearing more than 130°. A pier, with a depth of 16 feet (4^m9) at its head, extends a short distance from the north-eastern side of Punta Sottile.

The light-buoy marking the shoal extending from the southern entrance point is described on page 491.

Valle San Bartolomeo is the quarantine anchorage for Trieste. The buildings of the Lazaretto, fronted by a quay reserved for commercial operations, are situated on the eastern side, Forte Olmi stands on a hill, about 4½ cables north-eastward of the quay, at an elevation of 342 feet (104^m2). There are some mooring buoys off the quay.

Light.—A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 18 feet (5^m5) in height, on the north-western angle of the quay in Valle San Bartolomeo (*Lat. 45° 36' N., Long. 13° 43' E.*).

Anchorages.—In Valle San Bartolomeo, large vessels can find good anchorage, in a Bora, westward of the Lazaretto, in a depth of 8 fathoms (14^m6), mud, good holding ground. During westerly winds, this anchorage may become dangerous.

Small vessels can find moderate anchorage, during south-westerly winds, in the southern part of the bay.

Measured distance.—Two beacons are erected on Punta Grossa, and two on Punta Sottile, for the purpose of indicating the length of a measured mile, the direction of which is with Molo Fratelli Bandiera lighthouse at Trieste, bearing 042°. The depth on this line is 10 fathoms (18^m3). Vessels, the speed of which exceeds 20 knots, must steer a course 2 miles north-westward of but parallel with this line.

Chart 201.

Northern side of gulf.—Light-buoy.—Punta del Tagliamento (*Lat. 45° 38' N., Long. 13° 06' E.*), the north-western entrance point of Golfo di Trieste, is a low projecting point. The mouth of Fiume Tagliamento lies on the north-eastern side of the point of that name. The bar of this river dries, but there is access to the river from Porto Baseleghe, page 599, and Porto Lignano, above the bar, whence the river is navigable, for a distance of about 8 miles inland, by vessels drawing less than 11 feet (3^m4); the village of Latisana lies about 9 miles north-north-westward of the mouth of Fiume Tagliamento.

Charts 201, 1440, 2158a.

Chart 201.

The position of the mouth can be identified by the lighthouse on the point. The coastal bank, with depths of 5 fathoms (9^m1) and less over it, is about 1½ miles wide off Punta del Tagliamento. A red conical light-buoy, G 6, exhibiting a *red fixed* light, is moored off the outer edge of this bank, about 1½ miles south-south-eastward of Punta del Tagliamento light-tower.

Charts 1434, Golfo di Trieste, 201.

A detached bank, with a least depth of 5 fathoms (9^m1) over it, 10 and about 3½ miles long in an easterly direction, lies with its western end about 3½ miles south-eastward of Punta del Tagliamento. A shoal, with a depth of 5½ fathoms (10^m1) over it, lies about 2½ miles east-north-eastward of the same point.

Chart 201.

15 **Light.**—A light is exhibited, at an elevation of 72 feet (21^m9), from a white circular tower on a dwelling, 69 feet (21^m0) in height, on Punta del Tagliamento (*Lat. 45° 38' N., Long. 13° 06' E.*).

Charts 1434, Golfo di Trieste, 201.

Coast.—Beacon.—Between Punta del Tagliamento and the town 20 of Grado, about 12 miles east-north-eastward, there is a bight the shores of which, for the most part, consist of the southern sides of a number of low islands, separated by channels and backed by mudbanks which dry and which are intersected by numerous creeks.

The campanile of the church in the village of Aquileia, situated about 25 5½ miles northward of Grado, is one of the few conspicuous objects along the northern side of Golfo di Trieste.

The shores of the bight, just mentioned, are bordered by a bank, with depths of less than 6 fathoms (11^m0) over it, which is as much as 3 miles wide in places.

30 Porto Lignano, page 496, is situated on the north-western side of the bight, about 4 miles north-eastward of Punta del Tagliamento. A conspicuous white house stands a short distance inland, about 1½ miles south-westward of Porto Lignano lighthouse.

Chart 1434, Golfo di Trieste.

35 Porto Sant' Andrea lies about a mile east-north-eastward of Porto Lignano, separated from it by Banco Martignano, which dries. The shore bank, with a depth of 2 feet (0^m6) over its outer edge, is about 7 cables wide off Porto Sant' Andrea.

40 Isola Sant' Andrea, which has a customs house at both its western and eastern ends, separates the port of that name from Porto Buso, page 497, about 3 miles eastward. *See view facing page 496.*

Between Porto Buso and Marina di Grado, page 497, about 5 miles east-south-eastward, the north-eastern side of the bight is formed by a number of islands, of which Isola Morgo is situated in the middle.

45 This part of the bight is fronted by a mudbank, about 6 cables wide, which dries; Banco d'Orio is situated at the eastern end of this mudbank and forms the western side of Marina di Grado. A narrow strip of dry land is situated near the outer edge of Banco d'Orio.

The Campanile, in the centre of the town of Grado, is conspicuous; 50 it is square and has a conical top.

Between Grado and Punta Sdobba, about 7½ miles east-north-eastward, the coast is considerably indented and is fronted by a mudbank. Banco Mula di Muggia, most of which dries, extends about 1½ miles offshore midway between Grado and the entrance to Canale Primero,

Charts 201, 1440, 2158a.

Chart 1434, Golfo di Trieste.

about 4 miles east-north-eastward. The southern side of this bank is marked by a light-beacon, *see* below ; depths of less than 6 fathoms (11^m0) extend about 6 cables southward of the light-beacon. A detached 3½-fathom (6^m4) patch lies about 2½ miles east-south-eastward of this light-beacon, close within the 6-fathom (11^m0) line ; and another detached patch, with a depth of 3½ fathoms (6^m9) over it, lies about 3½ miles east-north-eastward of the light-beacon, also close within the 6-fathom (11^m0) line and 2½ miles offshore.

The entrance to Canale Primero is a narrow opening in the mudbank bordering the coast. The entrance to the channel, which can be identified by some cottages with a group of trees near them, is marked by two lines of piles. The greatest depth on the bar was 2 feet (0^m6), in 1939 ; the depths are liable to change and the piles are liable to be washed away.

The entrance to Canale Averno lies about half a mile north-eastward of that of Canale Primero. This channel is only accessible to boats ; it connects Canale Primero with Fiume Isonzato, which flows into Fiume Sdobba about 2½ miles north-eastward.

Punta Sdobba is low and sandy and is formed by the mouth of Fiume Sdobba, the lowest reach of Fiume Isonzo. A pyramidal beacon stands on the northern bank of Fiume Sdobba about 3 cables westward of the entrance. Punta Sdobba is bordered by a bank, with depths of less than 6 fathoms (11^m0) over it, extending 1½ miles offshore. Sandbanks, which dry, extend eastward from both sides of the river mouth for about three-quarters of a mile ; a short distance farther eastward, another sandbank, which dries, lies across the axis of the channel. The bar, over which there was a depth of less than one foot (0^m3), in 1939, is only practicable for boats.

Both Fiume Isonzo and Fiume Isonzato, above the bar, are navigable for some distance inland ; the latter for vessels drawing not more than 6 feet (1^m8).

The ebb tidal stream in Fiume Isonzo may attain a rate of 5 knots, but the rate is always moderate in Fiume Isonzato.

Chart 201.

Lights.—Light-buoys.—A light is exhibited, at an elevation of 25 feet (7^m6), from a red square masonry hut, with a white cupola and base, 21 feet (6^m4) in height, on the head of the pier on the western side of the entrance to Porto Lignano (*Lat.* 45° 42' N., *Long.* 13° 09' E.).

Chart 1434, Golfo di Trieste. A light is exhibited, at an elevation of 33 feet (10^m1), from a white iron framework structure on a circular tank, 28 feet (8^m5) in height, on the head of the pier extending from Isola di Porto Buso, situated on the eastern side of the entrance to Porto Buso.

A red can light-buoy, surmounted by a staff, exhibiting a *red flashing* light of *one second* duration *every five seconds*, is moored about 1½ miles southward of the light-structure at Porto Buso.

A conical buoy, surmounted by a ball, is moored about 1½ miles southward of the entrance to Marina di Grado.

The lights within Marina di Grado are described on page 498.

A light is exhibited, at an elevation of 22 feet (6^m7), from a white iron framework structure on piles, 28 feet (8^m5) in height, on the southern extremity of Banco Mula di Muggia.

A light is exhibited, at an elevation of 22 feet (6^m7), from a trun-

Charts 201, 1440, 2158a.

Chart 1434, Golfo di Trieste.

cated conical concrete tower and gallery on a circular base, 25 feet (7^m6) in height, near the outer end of the bank extending eastward from Punta Sdobba.

- 5 **Off-lying buoys.**—A number of conical buoys have been established off the stretch of coast just described. Buoys G 5 and G 4 are moored, the former about 6 miles south-south-westward of the light-structure at Porto Buso, the latter about 4½ miles south-westward of Grado campanile. Buoys G 3, G 2 and G 1 are moored about 2 miles south-
10 south-westward, 3½ miles east-south-eastward, and 7½ miles east-south-eastward, respectively, of the light-structure on Banco Mula di Muggia.

- Anchorage.**—There is anchorage, known as Morgo anchorage, off this coast between Porto Buso and Grado, in depths of from 5 to 6
15 fathoms (9^m1 to 11^m0), with a house on Isola Morgo in line with the campanile of Aquileia, bearing about 033°; small vessels can anchor farther northward in a depth of about 4½ fathoms (8^m2). This anchorage affords shelter from offshore winds; it should be quitted immediately with south-easterly, southerly and south-westerly winds.

- 20 **Porto Lignano.**—The entrance to Porto Lignano is about 2 cables wide and is fronted by a bar, over which there was a least depth of 6 feet (1^m8) in 1931, and which is about a mile wide. The passage across the bar lies in the *white* sector of the light on Lignano pier between bearings of from 298° to 324°. The inner part of this passage
25 is marked, on both sides, by groups of stakes.

- From the entrance, a channel runs inland for a distance of about a mile into Laguna di Marano, receiving the waters of Fiume Stella and several other channels. The port has communication by water with the villages of Marano, Muzzana and Palazzolo. Marano and
30 Muzzana lie about 4 and 7 miles, respectively, northward of Lignano, and Palazzolo, which is connected to the railway system, about 7 miles north-north-westward of Lignano (*Lat. 45° 42' N., Long. 13° 09' E.*).

- A customs house, fronted by a pier, stands on the western side of the entrance. On the coast southward of the customs house there are
35 several buildings and a bathing establishment.

- Caution.**—The low coast in this neighbourhood should be approached with caution and not within a distance of 2 miles unless the entrance can be distinguished. The low square tower of Marano church and the belfry at Grado are conspicuous. *See view facing*
40 *this page.*

In south-easterly gales it is not prudent to attempt to enter Porto Lignano, owing to the breaking seas on the bar. A vessel should not enter without local knowledge.

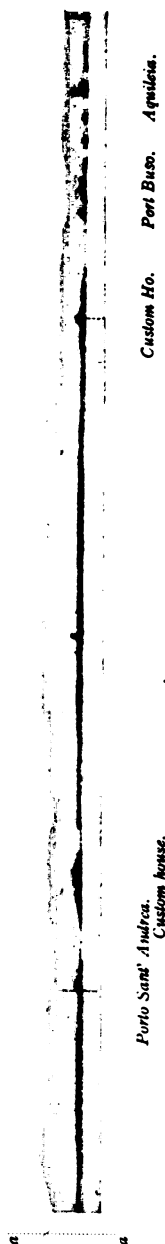
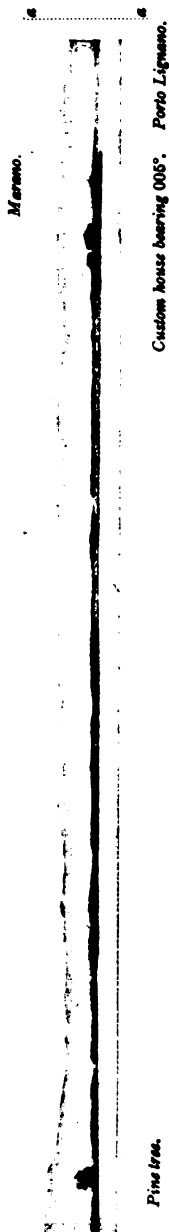
- Lights.**—The light on Lignano pier is described on page 495.
45 A light, for the use of fishermen, is exhibited on the bridge at Marano.

- Anchorage.**—The best berth is off the entrance to Canale di Marano, situated on the eastern side of the port about a mile northward of the entrance, with the customs house at Porto Buso bearing
50 085°, where a vessel can moor, with open hawse southward, in complete shelter.

A vessel can lie alongside the pier.

A vessel, awaiting entry, can anchor about 2 miles offshore, with Marano church tower, bearing about 356° and Punta del Tagliamento,

Charts 201, 1440, 2158a.



View in 2 parts of coast in vicinity of Porto Lignano and Porto Buso.
(Original dated 1910.)

Chart 1434, Golfo di Trieste.

bearing 244° , in depths of from $5\frac{1}{2}$ to 6 fathoms (10^m 1 to 11^m 0), good holding ground.

Porto Buso.—Buoys.—Porto Buso is formed at the confluence of Fiume Aussa Corno, which flows into its northern end, Canale Muro, on its western side, and Canale Anfora vecchia, on its eastern side; it is only suitable for small vessels, with local knowledge, which use inland channels. The bar fronting the port is about three-quarters of a mile wide and has some patches on it, over which there are depths of less than 6 feet (1^m 8), but a narrow channel, with a depth of a little over 6 feet (1^m 8) in it, leads into the harbour where the depths are greater. The inner part of the entrance channel is marked, on the eastern side, by three black conical buoys, each with a conical topmark and, on the western side, by two red conical buoys, each with a cylindrical topmark.

There is a customs house, situated on the eastern end of Isola Sant' Andrea, on the western side of the harbour. Isola di Porto Buso lies on the eastern side of the harbour; a short pier extends westward from the southern end of this island. The light on this pier has already been described.

Caution.—It is not safe to enter or leave Porto Buso during fresh south-easterly winds, on account of the heavy seas at the entrance.

Anchorage.—There is open anchorage, in a depth of about $4\frac{1}{2}$ fathoms (8^m 2), with the light-structure on the pier at Porto Buso (*Lat.* 45° $43'$ *N.*, *Long.* 13° $15'$ *E.*) bearing 331° , distant about $2\frac{1}{2}$ miles.

Marina di Grado.—This harbour communicates by inland waterways with Buso, Marano and Aquileia; it is formed by openings through the banks and by the lagoons northward of the town of Grado. Banks, with depths of less than 6 feet (1^m 8) over them, extend offshore for a distance of about a mile on both sides of the entrance to the harbour.

Entrance channel.—Buoys.—A channel has been dredged through the banks just described; it is marked by four pairs of buoys. The buoy at the entrance is described on page 495. There was a depth of about 10 feet (3^m 0), in 1939, in this channel. The banks are affected by freshets from the lagoons and by strong winds from seaward, and the depths in the channel are liable to change.

Harbour.—Bridge.—The harbour of Grado is entered between the heads of two moles, about $2\frac{1}{2}$ cables apart. The eastern mole is curved and extends from the western side of the town for about $3\frac{1}{2}$ cables. The western mole extends 7 cables south-eastward and then 2 cables south-south-eastward from an island situated about $1\frac{1}{2}$ miles north-westward of the church in Grado. Isola San Pietro d'Orio lies about 2 cables north-north-westward of the root of the western mole.

Northward of these moles there are two channels; Canale di San Pietro d'Orio, the western channel, leads to the island of that name, and Canale di Grado, the eastern channel, leads in a north-easterly and then easterly direction to the northern side of the town of Grado; an islet lies on the southern side of this channel, about $1\frac{1}{2}$ cables eastward of the junction of the two channels. The light at the junction of these channels shows *green* in Canale di San Pietro d'Orio and *red* in Canale di Grado.

From the northern end of the town, a narrow channel leads into the centre of the town where there are two basins. A pier projects

Chart 1434, Golfo di Trieste.

a short distance westward from the western side of the entrance to this channel.

The island on which the town stands is connected to the mainland by a bridge with a movable span. From 1st of May to 31st of August, the bridge will be opened, on request to the Port Office, between 0600 and 0700, and between 1700 and 1800; during the other months the times of opening are between 0700 and 0800, and between 1600 and 1700.

The following signals are displayed from a mast at the entrance to this channel:—A black ball at the masthead indicates that entrance is prohibited; a black ball at half-mast indicates that entrance is permitted.

Canale di Belvedere, which trends northward, is entered from the northern side of the channel, opposite the town.

Eastward of the town, a shallow, narrow channel trends about 2 cables southward and then turns gradually east-north-eastward for a distance of about half a mile. Part of this channel is quayed and it is accessible to vessels 105 feet (32^m0) long, drawing not more than 8 feet (2^m4).

Lights.—A light is exhibited, at an elevation of 9 feet (2^m7), from a red wooden pile structure, 10 feet (3^m0) in height, on the western side of the entrance to Canale di San Pietro d'Orio (*Lat. 45° 41' N., Long. 13° 22' E.*).

A light is exhibited, at an elevation of 9 feet (2^m7), from a red pile structure, surmounted by a St. Andrew's cross, painted black and white, situated at the junction of Canale di San Pietro d'Orio and Canale di Grado.

A light is exhibited, at an elevation of 9 feet (2^m7), from a pile structure, 10 feet (3^m0) in height, situated on the northern extremity of the islet on the southern side of Canale di Grado, about 2 cables eastward of the above light.

A light is exhibited, at an elevation of 17 feet (5^m2), from an iron column, 15 feet (4^m6) in height, on the head of the pier projecting from the western side of the entrance of the channel leading to the centre of the town.

A light is exhibited, at an elevation of 9 feet (2^m7), from a pile structure, 10 feet (3^m0) in height, on the western side of the entrance to Canale di Belvedere.

Anchorage.—There is anchorage, in fine weather, for large vessels, south-south-eastward of Marina di Grado, according to draught; the bottom consists of sand and mud.

Town.—Communications.—Grado contained about 5,830 inhabitants, in 1939. There is a large tunny fishery and also shipyards for building small coasting vessels and boats. There are several hotels and bathing establishments.

There is frequent steamer communication with Trieste and with the railway station at Belvedere, about 3 miles northward of the town.

Fresh provisions can be obtained.

There is a civil hospital.

Baia di Panzano.—This bay is entered between Punta Sdobba, page 494, and the small harbour of Duino (*Lat. 45° 46' N., Long. 13° 36' E.*), about 3½ miles north-eastward. The shores of the bay are bordered by a bank, with depths of less than 3 fathoms (5^m5) over it,

Charts 201, 1440, 2158a.

Chart 1434, Golfo di Trieste.

which is as much as a mile wide in places off its south-western and north-western sides, becoming narrower off Duino. A patch, with a depth of 31 feet (9^m4) over it, lies about 1½ miles north-eastward of the light-tower off Punta Sdobba and close within the edge of the 6-fathom (11^m0) bank extending off that point which has been mentioned previously. A patch, with a depth of 29 feet (8^m8) over it, lies about 1½ miles south-westward of the light-column at Duino. In the middle of the bay, the bottom consists of sand and mud, with mud under the coast.

The coast, on the western side of the bay and at its head, is low ; at Duino, the land begins to rise.

Baia di Panzano is exposed to the Bora, which blows strongly, and also to the Scirocco, which raises a considerable sea.

On the north-eastern side of the bay, the village and castle of Duino stand on a rocky height at the foot of which there is a small artificial harbour, open westward and protected by a short breakwater extending from the western side of the village. There is a short quay in the harbour, which has accommodation for only a few small vessels. Duino is connected to the railway system, the station being situated about three-quarters of a mile east-north-eastward of the village.

Fiume Timavo flows into the sea through an extensive shifting sand-bank, about half a mile westward of Duino. There are depths of 3 feet (0^m9) over the bar of this river and from 6 to 11 feet (1^m8 to 3^m4) in the upper reaches. The marshy land on the northern side of Baia di Panzano terminates at Fiume Timavo. The outer edge of the shallow bank off the mouth of Fiume Timavo is covered by the *green* sector of the light at Duino, bearing more than 065°.

Lights.—**Light-buoy.**—The light off Punta Sdobba is described on page 496.

A light is exhibited, at an elevation of 18 feet (5^m5), from a black iron column, 9 feet (2^m7) in height, on the head of the breakwater at Duino (*Lat.* 45° 46' N., *Long.* 13° 36' E.).

A can light-buoy, painted in black and red bands, surmounted by an iron beacon, and exhibiting a *white flashing* light *every five seconds*, duration of flash *half a second*, is moored at the entrance of the channel leading to Porto di Monfalcone.

Anchorage.—Large vessels can anchor south-westward of Duino, in a depth of 5½ fathoms (10^m1) ; smaller vessels can anchor closer inshore.

Channel of approach to Porto di Monfalcone.—**Lights.**—**Buoyage.**—At the head of Baia di Panzano there is a narrow channel, about a mile long in a north-north-westerly direction, which has been dredged through the mudbank extending offshore. At its northern end, this channel leads northward into Porto di Monfalcone, between the north-eastern end of Penisola di Panzano, situated about 2½ miles west-north-westward of Duino, and the coast, about half a cable eastward.

This channel had, in 1938, a depth of about 28 feet (8^m5) ; depths of 17 and 14 feet (5^m2 and 4^m3) were, however, reported in 1940, to exist in places near its axis.

Two leading lights are exhibited, the front light, at an elevation of 65 feet (19^m8), from an iron framework structure, painted in black and white bands, 72 feet (21^m9) in height, near the north-eastern extremity

Chart 1434, Golfo di Trieste.

of Penisola di Panzano; the rear light, at an elevation of 111 feet (33^m8), on an aviation mast, painted in black and white bands, 131 feet (39^m9) in height, situated about 1½ cables north-north-westward of the front light. These lights in line, bearing 339°, lead up the axis of the dredged channel.

Two lights are exhibited, each at an elevation of 11 feet (3^m4), from a dolphin, 13 feet (4^m0) in height, on the eastern side of the entrance to Porto di Monfalcone; the southern, at a distance of about 2 cables south-south-eastward of the front leading light; the northern at a distance of three-quarters of a cable eastward of the front leading light.

A light is exhibited, at an elevation of 17 feet (5^m2), from a black iron framework structure, 12 feet (3^m7) in height, on the north-western corner of the quay on the eastern side of Porto Rosega, about one mile inland (Lat. 45° 48' N., Long. 13° 33' E.).

Two black conical buoys, surmounted by cones, mark the eastern side of the channel and two red conical buoys, surmounted by cylinders, mark the western side.

Porto di Monfalcone.—This harbour consists of Porto Rosega, at its south-eastern end; Bacini di Panzano, which is entered from the south-western end of Porto Rosega between the leading lights previously mentioned; and Canale Valentinis, which is a continuation northward of Porto Rosega and terminates close southward of Monfalcone, a town situated about 1½ miles inland (chart 201).

Conflicting currents and superficial whirlpools are frequently observed in the various portions of the harbour.

Porto Rosega.—This harbour consists of a basin, about 5 cables long and one cable wide. The sides are partially quayed; Banchina Solvay, fronting a factory on the eastern side, is about half a cable long and has a depth of about 24 feet (7^m3) alongside. There are some conspicuous chimneys in the factory just mentioned.

On the western side of the basin there is a dockyard, for the most part fronted by quays; there is a depth of 24 feet (7^m3) alongside these quays, except the northernmost, which has a depth of 16 feet (4^m9) alongside.

A floating dock, *see* App. I, page 601, is situated in the north-western part of Porto Rosega. There are several warping buoys off the dockyard.

Submarine cable.—A submarine cable is laid across the entrance to Bacini di Panzano. The landing places are each marked by an inverted anchor painted on the wall. Vessels should not anchor here.

Bacini di Panzano.—This is an artificial harbour, which, in 1939, was in course of development; it is divided into three basins by two projections extending from its north-western side.

Shallow banks extend from both sides of the entrance, leaving a narrow, unmarked channel, with depths of 16 feet (4^m9) in the fairway, leading to the eastern side of the north-eastern basin. This side of the basin is almost completely embanked and on it, there is an aero establishment with some conspicuous masts. In the north-eastern corner of this basin, there are two floating docks, one of 1,200 tons and the other of 800 tons. Vessels drawing 14 feet (4^m3) can secure to the quays, but should not approach them without local knowledge, as there are depths of less than 10 feet (3^m0) in the central part of the basin.

Charts 1440, 2158a.

Chart 1434, Golfo di Trieste.

On the north-western side of the middle basin, there is a quay, about half a cable long, for the use of local steamers.

Canale Valentinis.—This channel terminates in a narrow basin, about $2\frac{1}{2}$ cables long; there were depths, in 1939, of from 8 to 10 feet (2^m4 to 3^m0) in the fairway of the channel and 13 feet (4^m0) in the basin. The north-eastern side of the channel is entirely embanked and the south-western side partially so. Cantiere navale Triestino, fronted by a quay, with depths of from 4 to 5 feet (1^m2 to 1^m5) along-side, is situated on the south-western side of the channel. There is a conspicuous watch-tower, surmounted by a tank, in the dockyard.

At its north-western end, Canale Valentinis communicates with inland waterways by Canale Dottori, which is fitted with sluices. The latter channel causes strong currents in the basin.

Chart 201.

Monfalcone.—This town (*Lat.* $45^{\circ} 48' N.$, *Long.* $13^{\circ} 32' E.$) had a population of 17,400, in 1939. In addition to the dockyard, there are a number of industries in the vicinity, of which the principal are the manufacture of soda and chemical products, the preparation of asphalt and oil refining. Coal and wood are imported. Fishing is carried out, at times, with nets in the various basins and with flares within 3 miles of the coast.

Charts 1434, Golfo di Trieste, 201.

Port facilities.—Repairs to hull and machinery can be executed. Three floating docks are maintained, for details of the largest, *see* App. I, page 602.

There are two 30-ton cranes on Banchina Solvay and various fixed and travelling cranes on the dockyard quay.

The quays are connected to the railway system.

Fresh provisions are obtainable and water is laid on to the quays.

There is a small civil hospital at Monfalcone.

A small supply of coal is kept in stock.

Pilotage.—There are no authorised pilots, but an experienced seaman can be obtained by application to the officials of Cantiere navale Triestino.

Directions.—A vessel desiring to enter Porto di Monfalcone should anchor in Baia di Panzano off the entrance of the dredged channel and await instructions for berthing.

Chart 1434, Golfo di Trieste.

North-eastern side of gulf.—Between Duino, page 498, and Porto di Trieste, about 9 miles south-eastward, the coast is lofty and almost inaccessible; there are a few places where coasters can find anchorage, but there is no place of refuge for larger vessels. The coast may safely be approached. On the heights near the coast are the villages of Santa Croce and Contovello, situated about $4\frac{1}{2}$ and 7 miles, respectively, south-eastward of Duino.

Between Duino and the village of Sistiana, about a mile east-south-eastward, the coast consists of precipitous cliffs and cultivated terraces; the shore is rocky, in some places coloured a reddish yellow, and boulders lie off it in several places.

Sistiana, which had a population of 231, in 1939, lies at the head of a small inlet which can be identified by the quarries in its steep sides. The inlet is protected by two short moles, one extending south-eastward from the western entrance point, and the other, westward from the

Charts 1440, 2158a.

Chart 1434, Golfo di Trieste.

eastern entrance point. There is a small mole, with a depth of 11 feet (3^m4) at its head, in the south-eastern corner of the inlet. Small vessels, with local knowledge, can find shelter in the inlet from south-easterly and south-westerly winds; the holding ground is bad. A vessel entering, should not pass within a distance of a quarter of a cable from the light-structure on the western side.

Banchina della Cava, about 164 feet (50^m0) long, with a depth of 10 feet (3^m0) at its head, is situated a short distance south-eastward of 10 Sistiana. There are some mooring buoys off this quay.

The large building of the aqueduct of Aurisina is situated on the coast, about 2½ miles south-eastward of Sistiana; Torre Aurisina, which is conspicuous, stands, at an elevation of 579 feet (176^m5), above this building, about 2 cables inland. There is a small boat harbour off the 15 aqueduct, protected by a small mole with some sunken obstructions extending from it.

Porticciolo di Santa Croce, about 1½ miles south-eastward of Aurisina aqueduct, is formed by a mole on its southern side and a breakwater projecting at right angles to the coast. The entrance, about 10 yards 20 (9^m1) wide, is obstructed by sunken blocks off the breakwater. The harbour is only suitable for boats drawing about 6 feet (1^m8). Small vessels can secure alongside the outer arm of the southern mole, in a depth of 13 feet (4^m0).

Castello di Miramare, conspicuous from all directions, stands on 25 a rocky projection about 6 miles south-eastward of Duino.

Valle Grignano lies on the north-western side of the projection just mentioned; in the eastern part of this bay there is a small harbour enclosed westward by a breakwater and northward by a mole. Small vessels can lie alongside the head of the mole, where there are depths of 30 8 feet (2^m4).

Porticciolo di Miramare, situated at the southern end of Valle Grignano, Porticciolo di Cedas and Porticciolo di Barcolo, about 1½ and 2 miles, respectively, south-eastward of Castello di Miramare, are only suitable for boats drawing less than 6 feet (1^m8).

35 **Lights.**—A light is exhibited, at an elevation of 21 feet (6^m4), from a red iron column, 16 feet (4^m9) in height, on the head of the western mole at Sistiana.

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 16 feet (4^m9) in height, on the head of the eastern mole at 40 Sistiana (*Lat. 45° 46' N., Long. 13° 38' E.*).

A light is exhibited, at an elevation of 16 feet (4^m9), from a black iron column, 13 feet (4^m0) in height, on the molehead at Porticciolo di Barcolo. This light-structure was reported, in 1945, to be damaged.

Anchorages.—There is moderately good anchorage, in a Bora, for 45 large vessels about 6 cables west-north-westward of Castello di Miramare, in a depth of about 9 fathoms (16^m5), sand, good holding ground; this anchorage is exposed to all other winds.

Small vessels can anchor, in a depth of about 6½ fathoms (11^m9), with the castle bearing about 143°, distant 3 cables.

50 **Prohibited anchorage.**—Anchorage is prohibited off a stretch of coast, about half a mile long, south-eastward of Castello di Miramare. *Chart 1434, Golfo di Trieste and Porto di Trieste.*

Eastern end of gulf.—Baia di Muggia and Porto di Trieste are situated at the eastern end of Golfo di Trieste. The former is entered

Chart 1434, Golfo di Trieste and Porto di Trieste.

between Punta Sottile, page 493, and the western extremity of Molo V, about $2\frac{1}{4}$ miles north-north-eastward. Molo V forms the northern side of Porto Emanuele Filiberto Duca d'Aosta, which is a part of Porto di Trieste; the remainder of the latter port extends about $1\frac{1}{4}$ miles north-north-eastward of Molo V (*Lat.* $45^{\circ} 38' N.$, *Long.* $13^{\circ} 45' E.$). 5

Baia di Muggia.—**Buoys.**—Baia di Muggia, which lies southward of the city of Trieste, is sheltered to a considerable extent from north-westerly and westerly winds by Diga Luigi Rizzo, which consists of three parts parallel with one another, the length and positions of which can best be seen on the chart. The southern end of the longest and southernmost part of this breakwater lies about 4 cables northward of Punta Ronco, which is situated three-quarters of a mile east-north-eastward of Punta Sottile. The northernmost part of Diga Luigi Rizzo lies about 2 cables westward of Molo V. 15

Chart 1434, Golfo di Trieste.

Baia di Muggia is backed by hills, mostly cultivated and on which there are numerous villages, farms and villas. At the head of the bay, the land is low and level, but here also hilly land, terminating in Punta Stramare, on the southern side, about $2\frac{1}{4}$ miles eastward of Punta Ronco, projects westward between extensive salines. 20

Two detached shoals lie in the northern part of the bay; one, with a depth of $5\frac{1}{4}$ fathoms (10^m) over it, at a distance of 4 cables east-south-eastward of the south-western angle of Molo VI and $1\frac{1}{4}$ cables offshore; the other, with a depth of 6 fathoms (11^m) over it, at a distance of about 7 cables south-eastward of the same point and 5 cables offshore. Molo VI lies about 2 cables south-eastward of Molo V. 25

A patch of foul ground, indicated on the chart, exists about half a mile west-south-westward of Punta Servola, situated about $1\frac{1}{4}$ miles east-north-eastward of Punta Ronco; and a similar patch exists about half a mile east-north-eastward of the southern extremity of Diga Luigi Rizzo. The former of these two patches is marked by buoys. 30

On the southern side of this bay, San Rocco dockyard is situated about three-quarters of a mile eastward of Punta Ronco. Here there is a small harbour, sheltered from all except northerly winds, and a quay capable of accommodating vessels of 8,000 tons. 35

The village of Muggia, which had a population of about 3,028, in 1939, lies on the coast about half a mile eastward of San Rocco dockyard. There is a basin at Muggia, formed by two moles; the western mole projects a short distance north-eastward and then a similar distance east-north-eastward and the eastern mole is about a cable long and projects north-north-westward, leaving a narrow entrance between its head and that of the western mole. There are depths in the basin of from 8 to 16 feet (2^m to 4^m), mud, bad holding ground. Alongside the quays within the basin, there are depths of from 3 to 11 feet (0^m to 3^m). Northerly winds cause a sea in the basin and strong south-westerly winds cause a swell. 45

Chart 1434, Porto di Trieste.

On the north-eastern side of Baia di Muggia, a pier projects a short distance southward, about $3\frac{1}{4}$ cables eastward of the root of Molo VI. Close eastward of this pier is Lloyd Arsenal, where there are two dry docks with a quay close eastward of them. In 1945, only the western and larger of these two dry docks was available. San Marco dockyard 50

Chart 1434, Porto di Trieste.

lies about 4 cables eastward of the dry docks. A pier projects about a cable south-westward from San Marco dockyard. In 1945, a small floating dock was moored off the head of this mole.

- 5 Molo dei Legnami projects in a south-westerly direction, about $2\frac{1}{2}$ cables south-eastward of San Marco pier.

Chart 1434, Golfo di Trieste.

- Punta Servola lies about 3 cables southward of Molo dei Legnami. A tongue of reclaimed land extends about a cable west-north-westward
10 from the northern side of Punta Servola. About half a mile south-eastward of Punta Servola, there is a small boat harbour, protected by two small moles at the head of which there are depths of 5 feet (1^m5).

- Porto del Petrolio di San Sabba lies about a mile south-south-eastward of Punta Servola. This harbour is protected westward by a
15 mole, 328 yards (299^m9) long; it affords shelter against a Bora.

- At the head of Baia di Muggia, Baia di Zaule is entered between the head of the mole just mentioned and Punta Stramare, about 7 cables south-eastward. About 3 cables eastward of Punta Stramare, a T-headed pier extends about $2\frac{1}{2}$ cables in a west-north-westerly
20 direction offshore; tank vessels can lie alongside the head of this pier.

There are a number of mooring buoys in Baia di Muggia.

Chart 1434, Porto di Trieste.

- Danger.—Buoy.**—A reef, with a depth of less than 6 feet (1^m8)
25 over its outer end, extends about a cable offshore close westward of the pier on the western side of Lloyd Arsenal. The southern end of this reef is marked by a buoy, surmounted by a staff and globe, painted black. Depths of less than 6 fathoms (11^m0) extend half a cable south-south-westward of this reef.

- 30 *Chart 1434, Porto di Trieste and Golfo di Trieste.*

- Lights.—Fog signal.**—A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column on a square concrete hut, 17 feet (5^m2) in height, on the northern end of the southernmost portion of Diga Luigi Rizzo (*Lat' 45° 38' N., Long. 13° 44' E.*). This light was
35 reported, in 1945, to be destroyed.

A light is exhibited, at an elevation of 31 feet (9^m4), from a red iron framework structure and tank, 25 feet (7^m6) in height, on the southern end of the middle portion of Diga Luigi Rizzo.

- A light is exhibited, at an elevation of 31 feet (9^m4), from a black iron
40 framework structure and tank, 26 feet (7^m9) in height, on the northern end of the middle portion of Diga Luigi Rizzo.

A light is exhibited, at an elevation of 22 feet (6^m7), from a red iron column on a square concrete hut, 18 feet (5^m5) in height, on the southern end of the northernmost portion of Diga Luigi Rizzo.

- 45 A light is exhibited, at an elevation of 26 feet (7^m9), from a black iron column on a hut, 25 feet (7^m6) in height, on the northern end of the northernmost portion of Diga Luigi Rizzo.

An air fog signal is sounded from a framework structure on the northern end of the northernmost portion of Diga Luigi Rizzo.

- 50 A light is exhibited, at an elevation of 21 feet (6^m4), from a white circular concrete hut, 18 feet (5^m5) in height, on the head of the eastern mole at Muggia.

- A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 17 feet (5^m2) in height, on the head of the western mole at
55 Muggia.

Charts 201, 1440, 2148a.

To face page 505.



Lt. Ho., N. end. Rojano. Lt. Ho., S. end. Molo Fratelli Bandiera Lt. Ho. Wharves.
Porto Vittorio Emanuele III breakwater.

Servola.

Porto di Trieste.

(Original dated 1910)

Chart 1434, Porto di Trieste and Golfo di Trieste.

A light is exhibited, at an elevation of 30 feet (9^m1), from an iron framework structure, on the head of the pier between the two docks at Lloyd Arsenal. This light-structure was reported, in 1945, to be damaged. 5

A light is exhibited on the head of the pier projecting south-westward from San Marco dockyard.

A light is exhibited, at an elevation of 20 feet (6^m1), from a red iron column, 16 feet (4^m9) in height, on the head of the mole protecting Porto del Petrolo di San Sabba. 10

Two lights, disposed vertically, are exhibited at elevations of 23 and 18 feet (7^m0 and 5^m5), respectively, from an iron post, 13 feet (4^m0) in height, on the head of the pier situated 3 cables eastward of Punta Stramarè (*Lat. 44° 36' N., Long. 13° 48' E.*).

Anchorage.—The whole of Baia di Muggia, with the exception 15 of Valle di Zauale, affords good shelter in a Bora and in other winds. The bottom, consisting of mud, is good holding ground. The patches of foul ground, previously mentioned, should be avoided.

Large vessels can lie alongside at San Rocco, in the petroleum harbour, and at the various quays in Porto Emanuele Filiberto Duca 20 d'Aosta, *see* below.

Regulations.—Navigation is prohibited north-eastward of an imaginary line, indicated on the chart, joining the head of the mole close westward of Lloyd Arsenal and the head of Molo dei Legnami. 25

Chart 1434, Porto di Trieste. **Porto di Trieste.**—This harbour, one of the most important in the Adriatic, consists of three parts. The southern part, which comprises the north-western part of Baia di Muggia, is named Porto Emanuele Filiberto Duca d'Aosta; the middle part, Porto Doganale; and the northern part, Porto Vittorio Emanuele III. *See* view facing 30 this page.

The Bora reaches Trieste with great violence from the high lands in the vicinity, especially in the winter season; in the summer, westerly winds which cause a heavy swell are the most inconvenient but they never last long. With strong southerly winds, the water sometimes 35 rises sufficiently to inundate parts of the city. *See* also Local winds, Eastern shore of the Adriatic, page 15.

Porto Emanuele Filiberto Duca d'Aosta.—This portion of Porto di Trieste extends from the pier on the western side of Lloyd Arsenal, page 503, to Molo V, and thence to Molo Fratelli Bandiera, 40 about 6 cables north-eastward; the whole is protected south-westward by Diga Luigi Rizzo. On the western side of Molo Fratelli Bandiera, there is a small harbour formed by a mole extending westward and south-westward from its head; in the north-eastern corner of this harbour, there is a boat harbour, near the head of which is the Health 45 office. A bathing establishment extends off the northern end of the quay between Molo V and Molo Fratelli Bandiera, leaving a narrow entrance into the small harbour.

Lights.—Off-lying buoys.—The lights and fog signal on Diga Luigi Rizzo are described on page 504. 50

A light is exhibited, at an elevation of 110 feet (33^m5), from a grey circular stone tower painted with black bands and surmounted by a grey cupola, 103 feet (31^m4) in height, near the head of Molo Fratelli Bandiera.

Charts 201, 1440, 2158a.

Chart 1434, Porto di Trieste.

A light is exhibited, at an elevation of 21 feet (6^m4), from a black iron column, 18 feet (5^m5) in height, on the elbow of the mole extending westward from the head of Molo Fratelli Bandiera.

- 5 A light is exhibited, at an elevation of 25 feet (7^m6), from a black iron column, 5 feet (1^m5) in height, on the north-eastern corner of Molo Fratelli Bandiera.

Two buoys are established westward of Molo Fratelli Bandiera ; the southern is a black can buoy with a globe topmark, laid about 3 cables
10 west-north-westward of the light-column on the northern end of the northernmost portion of Diga Luigi Rizzo ; the northern is a red conical buoy, surmounted by two cones points upwards, laid about 4 cables north-north-westward of the same light-column.

Time signal.—Visual and sound time signals are made from the
15 light-column on the north-eastern corner of Molo Fratelli Bandiera.

Porto Doganale.—This is the old harbour of Trieste and lies between Molo Fratelli Bandiera and Molo IV, the southernmost mole of Porto Vittorio Emanuele III, about half a mile north-eastward ; it is sheltered from easterly winds but exposed to westerly winds. Molo
20 Fratelli Bandiera protects it from south-westerly winds.

Porto Doganale is lined with quays from which five moles project north-westward from its south-eastern side. Molo Bersaglieri, the only mole in this harbour which is available for deep-draught vessels, lies about $2\frac{1}{2}$ cables eastward of Molo Fratelli Bandiera. Northward
25 of Molo Audace, the north-easternmost of these five moles, is the entrance to Canale Grande ; this channel, which extends south-eastward into the city, is crossed by two swing bridges and is available for small craft, drawing less than 15 feet (4^m6), for a distance of about $2\frac{1}{2}$ cables.

Porto Vittorio Emanuele III.—This harbour, situated northward
30 of Porto Doganale and in front of the central railway station, consists of a quay from which five moles project west-south-westward forming four basins. From the head of the northernmost mole, an arm projects south-south-eastward ; the other moles are numbered I, II, III and IV from northward. The harbour is protected by a breakwater,
35 running parallel with the shore, with its southern end about $1\frac{1}{2}$ cables north-westward of Molo IV. A spur extends a short distance off the eastern side of the northern end of the breakwater, leaving a passage, half a cable wide, between its head and that of Molo I.

In 1941, there was a least depth of 21 feet (6^m4) in the northernmost
40 basin ; 23 feet (7^m0) alongside the quay in the second basin ; 24 feet (7^m3) alongside the quay in the third basin ; and 15 feet (4^m6) alongside the quay in the southernmost basin. The moles and quays are fitted with appliances for handling cargo and are connected to the railway system.

45 *Chart 1434, Golfo di Trieste.*

Lights.—Radio masts.—A light is exhibited, at an elevation of 378 feet (115^m2), from a white circular stone tower surmounted by a bronze figure, 223 feet (68^m0) in height, situated on Collina Gretta, about half a mile northward of the northern end of Porto di Trieste
50 (*Lat. $45^\circ 41'$ N., Long. $13^\circ 46'$ E.*).

There are two conspicuous radio masts about $3\frac{1}{2}$ cables eastward of this light-tower.

Chart 1434, Porto di Trieste.

A light is exhibited, at an elevation of 23 feet (7^m0), from a black

Charts 201, 1440, 2158a.

Chart 1434, Porto di Trieste.

column on a circular concrete hut, 23 feet (7^m0) in height, on the northern end of the breakwater at Porto Vittorio Emanuele III.

A light is exhibited, at an elevation of 19 feet (5^m8), from a black concrete column on a concrete hut, 18 feet (5^m5) in height, on the head of the spur extending off the north-eastern side of the breakwater at Porto Vittorio Emanuele III.

A light is exhibited, at an elevation of 23 feet (7^m0), from a red iron column on a square concrete hut, 23 feet (7^m0) in height, on the southern end of the breakwater at Porto Vittorio Emanuele III.

Off-lying buoy.—A red conical buoy, surmounted by a double cone, points upwards, is moored about 1½ miles west-south-westward of the light-tower on Collina Gretta.

Pilotage.—Pilotage is compulsory. Harbour pilots for mooring vessels in the harbour are sent on board. Private pilots for Golfo di Trieste can be obtained from the office of the Captain of the Port.

Anchorage.—Large vessels can moor, in a depth of about 10 fathoms (18^m3), northward of Molo Fratelli Bandiera and westward of the breakwater at Porto Vittorio Emanuele III (*Lat.* 45° 40' N., *Long.* 13° 46' E.).

Prohibited anchorage.—Anchorage is prohibited in Porto Doganale in an area southward of two imaginary lines drawn from the southern end of the breakwater at Porto Vittorio Emanuele III, one to the sheds of the aerodrome at the root of Molo IV, and the other drawn in a 256° direction for a distance of about 1½ miles.

Caution.—Dumping ground.—A dumping ground for explosives, now disused, was established, in 1945, from about 3 to 8 cables north-westward of Molo Fratelli Bandiera. This area is indicated on the charts by pecked lines.

Regulations.—1. A steam vessel arriving at, departing from or under way in Porto di Trieste in the area eastward of an imaginary line joining the northern end of the northernmost portion of Diga Luigi Rizzo and the northern end of the breakwater at Porto Vittorio Emanuele III should proceed and manœuvre at reduced speed.

2. A steam vessel from Baia di Muggia, Baia di Capodistria, and Baia di Pirano should, when entering Porto di Trieste, pass as close as possible to Molo Fratelli Bandiera, whilst those outward bound to those bays should keep not less than 164 yards (150^m1) from the above mole.

3. A steam vessel intending to pass between Diga Luigi Rizzo, on the western side, and Molo V and Molo VI, on the eastern side, should keep on the starboard hand in this passage.

4. A steam vessel approaching or departing from the moles and quays in Porto Doganale should proceed at the lowest possible speed when nearing the heads of the moles in that harbour.

5. In Porto Doganale, a steam vessel approaching that portion of the quay which lies between two moles should pass close to the mole that lies at the south-western end of the quay; when departing, she should pass close to the mole that lies at the north-eastern end of the quay.

6. Sailing or pulling boats within the port must keep clear of steam or sailing vessels which are entering or departing.

Regulations concerning seaplanes.—During the arrival and departure of seaplanes, which take place either inside Porto Vittorio Emanuele III breakwater or in an area southward and westward of

Chart 1434, Porto di Trieste.

the southern end of that breakwater and northward of Molo V, these areas should be left clear.

- A long blast on the siren will be sounded from the head of Molo IV five minutes before the arrival or departure of seaplanes : immediately before the arrival or departure, two blasts will be sounded and a red ball displayed at the root of Molo IV until the completion of the manœuvre, when a short blast will be sounded.

Chart 1434.

- Trieste.**—This large and important city, which contained 237,717 inhabitants, in 1939, is situated on an acclivity at the foot of a range of mountains and hills. Poggioreale (Opicina), a mountain, 1,302 feet (396^m8) high, stands about 1½ miles north-north-eastward of Molo IV ; Monte Cal, 1,466 feet (446^m8) high, about 2¼ miles east-north-eastward ; and Monte Bello, 879 feet (267^m9) high, about 2¼ miles south-eastward of the same mole. Beyond these mountains rise the Julian Alps, with the pass at an elevation of 1,800 feet (548^m6) and the summit 4,000 feet (1219^m2) high. There are numerous white villas on the slopes of the hills. See view facing page 505.

- The unfavourable and rocky nature of the limestone soil in the neighbourhood of Trieste and in Istria, where a large portion of the soil is sandstone, and the want of water, which in dry seasons becomes serious, render the cultivation of the land far from profitable. It is best adapted for vine and olive culture, and the country population derive their subsistence chiefly from the produce of the former.

Trieste is well built, but cannot be considered healthy, its death rate being ordinarily high ; this is attributable partly to the insufficient water supply, and to its inferior quality, and partly to the quantity of limestone dust generally floating in the air.

- There is an English sailors' reading room and a civil hospital where foreign seamen are received. An excellent chamber of commerce exists, and a school of navigation, to which an observatory is attached. There is an English church.

British Consular officers reside at Trieste.

- Fuel and supplies.**—Large quantities of coal and fuel oil are usually kept in stock.

Vessels generally coal alongside the coaling wharves, but there are a number of lighters. Coal is put on board at the rate of about 25 tons an hour.

- Fuel oil can be supplied by pipelines alongside the wharf or from lighters at rates of from 150 to 250 tons an hour.

Fresh provisions are plentiful. Water is laid on to the quays or can be supplied in water boats on application to the harbour authorities.

- Communications.**—Trieste (Lat. 45° 39' N., Long. 13° 46' E.) is connected to the general railway system. There are two railway stations, one near the root of Molo Fratelli Bandiera and the other at Porto Vittorio Emanuele III.

There is regular steamer communication with Italian and Adriatic ports and all parts of the world.

- Vessels lying at Trieste can be connected to the general telephone system on application to the Harbour master.

There is an air mail service between Trieste and Venice and Pola.

Trade.—In the year 1939 steam vessels of a total tonnage of 5,677,000 tons entered the port.

Charts 201, 1440, 2158a.

Chart 1434.

The industries in the city include distilling of mineral oils, iron forging, shipbuilding, chemistry, weaving, the manufacture of tobacco, &c.

The principal exports are timber, paper, cement, iron, steel, cereals, sugar, &c. ; the imports are coal, mineral oils, extracts of fruit and seeds, cotton, rice, coffee, &c.

Port facilities.—There is a civil hospital where foreign seamen are received.

There are large shipbuilding yards and workshops, and several dry docks ; for details of the largest dock, *see* Appendix I. At Lloyd Arsenal quay there is a crane capable of lifting 150 tons. There are sheers for lifting 80 tons, three 60-ton cranes and a 30-ton floating crane. In the boiler factory there is a steam hammer and every requisite for repairing boilers ; castings of 15 tons weight can be made.

There are several tugs.

The quarantine anchorage is in Valle San Bartolomeo, page 493.

The daily meteorological bulletin is exhibited at the office of the Captain of the Port.

Deratisation can be carried out, *see* page 50.

Charts 201, 1440, 2158a.

CHAPTER X

COAST OF ITALY FROM CAPO SANTA MARIA DI LEUCA TO FIUME TRONTO.

*Chart 1440.***WESTERN SIDE OF THE ADRIATIC.—General remarks.—**

The coast of Italy westward of Capo Santa Maria di Leuca is described in Mediterranean Pilot, Vol. II. Between Capo Santa Maria di Leuca and Fiume Tronto, about 275 miles north-westward, the coast of Italy, which forms the western side of the Adriatic, is generally low, with the exception of the easternmost portion and Promontorio del Gargano, about 165 miles north-westward of Capo Santa Maria di Leuca.

Charts 198, plan of Sta. Maria di Leuca anchorage, 1635.

- 10 **Coast.**—Capo Santa Maria di Leuca (*Lat. 39° 48' N., Long. 18° 23' E.*) is the eastern entrance point of Golfo di Taranto and the western entrance point of the Adriatic; the land rises gradually to an elevation of 459 feet (139^m9), a short distance northward of the cape.

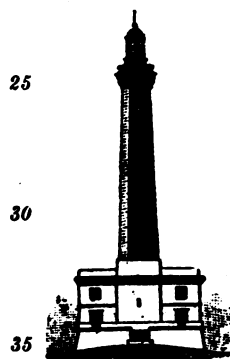
- This cape is easily identified by the light-tower on it; by the church 15 in the village of Leuca, situated at the head of the bight between Punta Meliso, the south-western extremity of Capo Santa Maria di Leuca, and Punta Ristola, about a mile west-south-westward; and by Torre dell' Omomorto, a circular building surrounded by dwellings built on a rocky eminence close to the beach westward of the village, three- 20 quarters of a mile westward of Punta Meliso.

- The coast westward of Capo Santa Maria di Leuca should not be closely approached on account of Secche di Ugento (see Mediterranean Pilot, Vol. II); in ordinarily clear weather the features of this coast are sufficiently distinguishable from a distance of 5 or 6 miles, but at times the land is enveloped in heavy clouds.

- A breakwater, 420 feet (128^m0) long, extends west-south-westward from a point about 2 cables north-north-westward of Punta Meliso. There is a landing place on the northern side of this breakwater.

- Light.—Signal station.**—A light is exhibited, at an elevation of 335 feet (102^m1), from a white octagonal tower and dwelling, 159 feet (48^m5) in height, on Capo Santa Maria di Leuca (*Lat. 39° 48' N., Long. 18° 23' E.*).

- A signal station is situated, at an elevation of about 380 feet (115^m8), in the vicinity of La Guardia, about 1½ miles



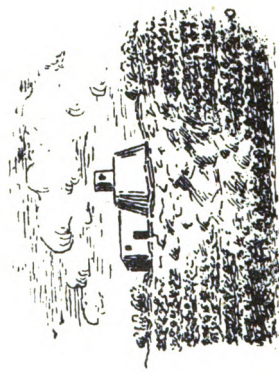
Capo Santa Maria di Leuca light-tower.

Charts 2701, 198, 1440, 2158a, 2158b.

To face page 511.

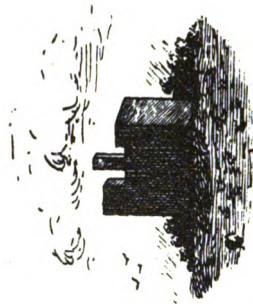


View in 2 parts of coast from Capo Santa Maria di Leuca to Porto di Castro.
(Original dated 1910.)



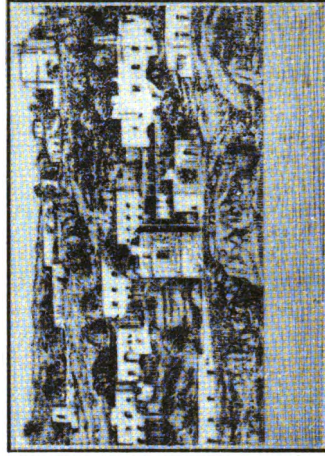
Torre Specchia grande,
bearing 265°, distant one
mile.

(Originals dated 1917.)



Torre Corsano, bearing
265°, distant one mile.

(Originals dated 1917.)



Torre Serra, from
eastward.

(Original dated 1939.)

Charts 198, plan of Sta. Maria di Leuca anchorage, 1635.

north-westward of Capo Santa Maria di Leuca ; it consists of a house with a grey octagonal tower with arched windows. Messages from vessels will be transmitted by telegraph.

Anchorage.—The bight between Punta Meliso and Punta Ristola affords shelter from north-easterly winds. It is dangerous with southerly winds. The best berth is off the village and midway between the two entrance points of the bight, in a depth of 6 fathoms (11^m0).

With a strong Bora, the squalls in this anchorage are very violent.

Small vessels, drawing less than 13 feet (4^m0), can find shelter from the sea caused by north-easterly winds, in a depth of about 4 fathoms (7^m3), sand, north-north-westward of Punta Meliso.

Chart 1635.

Coast.—Current.—Between Capo Santa Maria di Leuca and Capo d'Otranto, 20 miles north-north-eastward, the coast consists chiefly of a cultivated, rocky plateau, on which there are numerous villages and towers ; of the former, Gagliano del Capo, 3 miles northward of Capo Santa Maria di Leuca, is conspicuous. *See view facing this page.* The coast is almost everywhere bold. Porto di Castro, about 13 miles northward of Capo Santa Maria di Leuca, and easily distinguished by the town from which it takes its name, has the only anchorage which affords even temporary shelter.

The south-going current is usually strong in this vicinity. Southward of Capo Santa Maria di Leuca, there is generally an east-going current, which may attain a rate of more than one knot, even with easterly winds.

The towers along this stretch of coast are conspicuous. *See sketches of towers facing this page and page 512.*

Torre Specchia grande, which is white and circular, is situated on the top of a hill, at an elevation of 420 feet (128^m0), about 5 miles northward of Capo Santa Maria di Leuca (*Lat. 39° 48' N., Long. 18° 23' E.*).

Torre Corsano, which is grey and white, is situated on the top of a hill, at an elevation of 430 feet (131^m1), about 1½ miles farther northward ; Torre Serra, which is grey and rectangular, is situated on the top of the cliffs about 7 cables northward of Torre Corsano.

Porto di Tricase, 8½ miles northward of Capo Santa Maria di Leuca, can be distinguished by a high, curved, white stone wall, built to support the road. The harbour is protected by a breakwater from winds from south-west, through north, to north-east, but those from other directions cause a heavy sea. It is suitable only for small craft. There are depths of from 4 to 6 feet (1^m2 to 1^m8) westward of the breakwater ; easterly winds are liable to cause a surf. *See view facing this page.* The village of Tricase, about 1½ miles inland, is connected to the railway system.

Torre Mito, which is grey and rectangular, is situated, at an elevation of 371 feet (113^m1), on the top of a hill, about a mile northward of Porto di Tricase, and, on the height above it, is the tower of the abbey of Santa Maria di Mito. Torre Marittima, which is grey and circular, is situated, at an elevation of 344 feet (104^m8), on the top of a hill, about 2 miles farther northward.

Punta Mocarone (Mugurone), about 12 miles north-north-eastward of Capo Santa Maria di Leuca, is steep and rocky, and, projecting south-eastward, forms Porto di Castro ; the town of Castro stands on a hill,

Charts 2701, 198, 1440, 2158a, 2148b.

Chart 1635.

325 feet (99^m1) high, about 3½ cables northward of this point. The castle, on the summit of the hill, and surrounded by a wall, is conspicuous from seaward. *See view facing page 511.*

- 5 In Porto di Castro, small vessels can anchor midway between the shores of the harbour west-north-westward of Punta Mocarone, in depths of about 4 fathoms (7^m3), sand and good holding ground. This anchorage is sheltered from northerly and westerly winds, but much exposed to those from eastward and south-eastward. Vessels
10 of deep draught can anchor about 4 cables south-westward of Punta Mocarone, in a depth of 8 fathoms (14^m6), mud, the town bearing 004°.

A limited supply of fresh provisions may be obtained; greater quantities can be procured from the town of Diso, about 2½ miles distant.
15 The town of Spongano, about 3 miles inland is connected to the railway system.

- Porto Miggiano lies 2 miles north-north-eastward of Porto di Castro; this harbour is little frequented on account of its small size and the bad quality of the bottom. Torre Miggiano, which is grey and circular,
20 is situated on the cliffs eastward of this harbour and Torre Saracena, which is grey and circular, stands on a hill, about half a mile farther north-eastward. Torre Cerfignano stands about a mile north-eastward of Torre Saracena.

The baths of Santa Cesarea, consisting of a group of ornamental
25 buildings, situated on the high rocky coast, about 3 cables eastward of Torre Saracena (*Lat. 40° 02' N., Long. 18° 28' E.*) are conspicuous.

- Porto Badisco is situated about 5 miles north-north-eastward of Porto di Castro; it has only sufficient space to shelter a few vessels of shallow draught, moored head and stern, from westerly and northerly
30 winds. It is in some measure sheltered from onshore winds but exposed to those from south-eastward, which cause a considerable sea. This harbour can be distinguished by Torre Minervina, standing on the edge of a high bank, about a mile southward of it, and Torre Sant' Emiliano, on a rocky buttress, the same distance northward of it;
35 also by the reddish customs house on the western side of the harbour. A few above-water rocks lie close offshore in the vicinity of Torre Sant' Emiliano. *See view facing this page.*

Charts 2701, plan of Port Otranto, 1635.

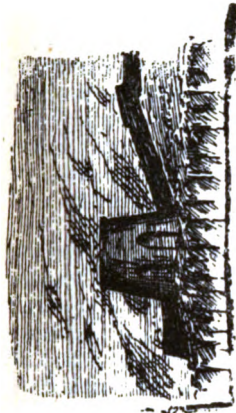
- Capo d'Otranto, which is situated about 1½ miles north-eastward of
40 Torre Sant' Emiliano, is the eastern extremity of a high, precipitous tableland. The buildings of San Nicola di Casole are situated about a mile west-north-westward of the cape, at an elevation of 292 feet (89^m0). Punta dell' Orto, the northern extremity of the high land, about 1½ miles northward of Capo d'Otranto, has, above it, a ruined
45 tower of the same name which stands at an elevation of 112 feet (34^m1). Torre Serpente or Cucurizzo, in ruins, stands about 3 cables north-westward of Torre dell' Orto, at an elevation of 112 feet (34^m1); this tower is conspicuous from northward. The town of Otranto lies about half a mile west-north-westward of Torre Serpente.

- 50 Between Capo d'Otranto and Punta Posta delle Fasci, which is low and rocky, about 1½ miles northward, there is a bight, the shore of which is fringed by above-water rocks; a rocky bank, with depths of less than 5 fathoms (9^m1) over it, and steep-to, extends about 3 cables from the north-western side of this bight. Southward of the bank, and

Charts 2701, 1440, 2158a, 2158b.



Torre Mito,
bearing 265° , distant
one mile.



Torre Marittima,
bearing 265° , distant
one mile.
(*Originals dated 1917.*)



Torre Miggiano,
bearing 310° , distant
half a mile.



Torre Saracena,
bearing 310° , distant
half a mile.

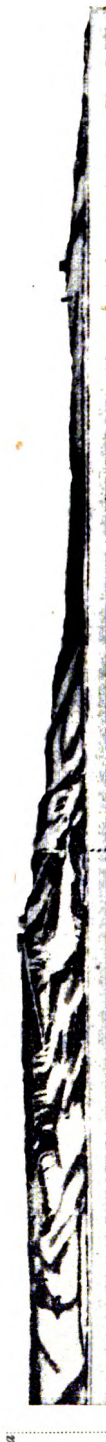
Santa Cesarea. Cerignano.
Coast from Porto di Castro to Porto Badisco.
(*Original dated 1910.*)

Porto Badisco.



Torre Sant'Emiliano.

Signal station.



Torre dell'Orto.

Lighthouse, Capo d'Otranto.
View in 2 parts of Capo d'Otranto.
(*Original dated 1910.*)

Charts 2701, plan of Port Otranto, 1635.

half a mile southward of Punta Posta delle Fasci, there is anchorage with offshore winds, in a depth of 8 fathoms (14^m6), sand.

Light.—Signal station.—A light is exhibited, at an elevation of 197 feet (60^m0), from a white circular tower above a two-storey dwelling, 105 feet (32^m0) in height, on Capo d'Otranto (*Lat.* 40° 06' N., *Long.* 18° 31' E.). See view.

A signal station is situated 2½ cables north-westward of the light-tower, in the vicinity of La Palascia, at an elevation of 285 feet (86^m9). Messages from vessels will be transmitted by telegraph. Storm signals are displayed; see page 43.

Telegraph cables.—Three submarine cables are landed near Punta dell'Orto.

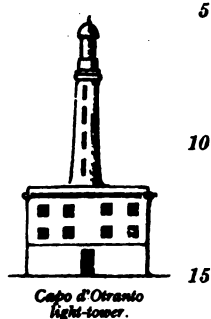
Chart 2701, plan of Port Otranto.

Porto Otranto. — Buoy. — Beacons. — Porto Otranto is entered between Punta San Nicola, situated about a mile north-westward of Punta dell'Orto, and Punta Craul, which is low and rocky, about 4 cables farther north-north-westward. The inner part of Punta San Nicola (*Lat.* 40° 09' N., *Long.* 18° 30' E.) is rather high; from its extremity a mole extends about one cable north-westward and then three-quarters of a cable west-north-westward, protecting the small quay, situated on the southern side of the mole; a rocky shoal extends a short distance off the head of this mole. This shoal is marked, on its north-western side, by a red can buoy, surmounted by a cone, moored in a depth of about 23 feet (7^m0). In the eastern approach to the port, between the molehead and a position about 6 cables east-south-eastward, the coast is bordered by a bank, with depths of 3 fathoms (5^m5) and less over it, which is as much as 1½ cables wide off Punta San Nicola. The head of Porto Otranto is fringed by a shallow sandbank, about half a cable wide, on which there are some rocks, both above-water and sunken, and depths of less than 3 fathoms (5^m5) extend about a cable farther offshore. Off the town south-westward of the molehead, the shore bank is about 1½ cables wide, leaving a narrow channel, between the banks on either side, into a small area, close south-westward of the mole where, in 1939, there were depths of about 3½ fathoms (6^m4).

Two masonry pyramidal beacons, each surmounted by a white pole, are established about 2 cables south-eastward of the molehead. The front beacon is painted in three verticle stripes, the centre stripe white and the other stripes black, and the rear beacon is painted white. These beacons, in line, bearing 125°, lead close south-westward of the molehead into the area just mentioned, and must be followed exactly.

Danger.—Secca La Scala, which breaks in heavy weather, and over which there is a depth of 4½ fathoms (8^m7), lies in the northern approach to Porto Otranto, about half a mile north-eastward of Punta Craul, near the outer end of a bank, with depths of less than 10 fathoms (18^m3) over it, which extends about 6 cables offshore a short distance northward of that point. Secca La Scala lies in the *white* sector of Punta Craul light bearing more than 183°.

Lights.—A light is exhibited, at an elevation of 45 feet (13^m7), from an iron framework structure on a wall, 33 feet (10^m1) in height, on Punta Craul.



Charts 2701, 1440, 2158a, 2158b.

Chart 2701, plan of Port Otranto.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron framework structure on a hut, 20 feet (6^m1) in height, on the head of the mole at Punta San Nicola.

- 5 **Anchorage.**—Small vessels can anchor with Punta Craul bearing 008°, distant 1½ cables, in a depth of 3½ fathoms (6^m9), sand, good holding ground; southward and south-eastward of this position the bottom is rocky. North-easterly and easterly winds cause a considerable sea, but the shelter with winds from north, through west, to south-east is very good. Vessels not wishing to enter the port may anchor in a depth of 10 or 11 fathoms (18^m3 or 20^m1), with Torre Serpente bearing 150° and the campanile of the cathedral bearing 217°, but the holding ground is not good, and a vessel should quit the anchorage on the first sign of wind from seaward.

- 15 **Directions.**—In clear weather the campanile of Lecce cathedral, on a hill, 19½ miles north-westward of Otranto and 6 miles from the coast, is the first conspicuous object seen by a vessel bound to Otranto from the Adriatic. When approaching from the south-eastward, the high land of Capo d'Otranto, the several towers before described, the signal station near La Palascia, and the lighthouse below it will be seen. After passing the cape, the buildings on the western side of the bay and then the town of Otranto and its castle will open out. If intending to go inside the mole, the northern shore of the harbour should be closely approached, so as to allow plenty of room to get on to the alignment of the leading beacons, 125°, which is the only guide for passing between the two rocky shoals in the entrance. Otherwise
25 steer for Punta Craul (*Lat.* 40° 09' N., *Long.* 18° 30' E.), bearing 282°, which leads to the outer anchorage and, if proceeding to the inner anchorage, alter course for it when the campanile of the cathedral
30 bears 215°. A vessel should pass northward, westward, and then southward of the buoy moored a short distance off the molehead.

Vessels approaching from the northward should give the coast in the vicinity of Punta Craul a berth of at least 8 cables until southward of Secca La Scala.

- 35 Bora gales raise a very heavy sea in the bay.

Town.—Otranto stands on a rocky site on the southern side of the port; there is a castle on the south-eastern side of the town. It contained about 2,500 inhabitants, in 1939.

- There is very little trade. The principal imports are eggs, cereals
40 and olives; oil is exported.

Otranto is connected to the general railway system.

Fresh provisions can be obtained in small quantities. See view facing this page.

Chart 1635.

- 45 **Coast.**—From Porto Otranto to the vicinity of Punta San Cataldo, about 17 miles north-north-westward, the coast consists chiefly of rocky tree-topped heights and cultivated ground, especially in the neighbourhood of Otranto; it then presents a low, level outline, and the land is marshy, with but few dwellings southward of Brindisi,
50 22 miles farther north-westward; the campanile of Lecce cathedral is the only conspicuous object until the shore is approached, when a few towers become visible. See view facing this page.

This stretch of coast is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, as much as a mile wide in places; there are

Charts 2701, 1440, 2158a, 2158b.

San Nicola di Casoli.

C. d'Otranto Lt. Ho.,
bearing 181°, distant 13 miles.

Otranto.

Torre San Stefano.

Castelli dei Turchi.

Borgagne.

Torre Sant' Andrea.

Torre dell' Orso.

View in 2 parts of coast from Capo d'Otranto to Torre dell' Orso.
(Original dated 1910.)

Railway station.

Torre dell' Orto.

Torre Serpente.

Otranto. Harbour (mole not shown).
Otranto.
(Original dated 1910.)

Serrano.

Specchia dell' Alto.

Campanile of
Lecce cathedral.

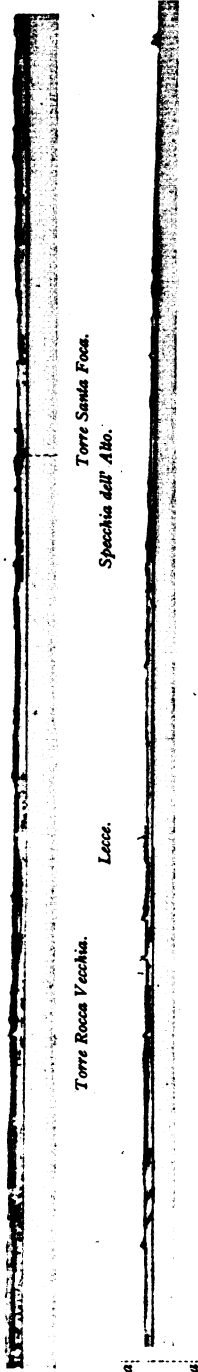
Anchorage.

San Cataldo Lt. Ho.,
bearing 208°, distant
about 6½ cables.

Punta San Cataldo.

Torre Veneri.

View in 2 parts of coast from Specchia dell' Alto to Torre Veneri.
(Original dated 1910.)



Torre Rocca Vecchia.

Lecci.

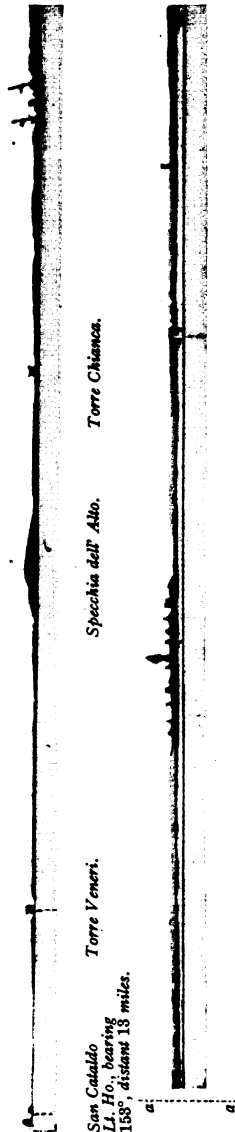
Torre Santa Foca.

Specchia dell' Alto.

Torre Specchia Ruggieri.

View in 2 parts of coast from Torre dell' Orso to Punta San Cataldo.
(Original dated 1910.)

*San Cataldo L. Ho.,
bearing 298°, distant
11 miles.*



*San Cataldo
L. Ho., bearing
158°, distant 13 miles.*

Torre Veneri.

Specchia dell' Alto.

Torre Chianca.

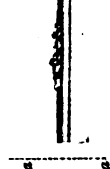
Lecci.

Torre Rinaldo.

View in 2 parts of coast from Punta San Cataldo to Torre Rinaldo.
(Original dated 1910.)

*Torre Specchiolla,
bearing 211°, distant
6 1/2 miles.*

Squinzano.



Torchiarolo.

Torre San Gennaro.

View in 2 parts of coast near Torchiarolo.
(Original dated 1910.)

Chart 1635.

sunken rocks on this bank here and there. The bottom, 3 cables from the coast is generally rock or sand, at a distance of one mile it is mud or sand, and farther out, rocky with patches of mud.

The outlet of Laghi Alimini, which is situated at the head of a small sandy bay of the same name, about $3\frac{1}{4}$ miles north-north-westward of Punta Craul, is crossed by a conspicuous bridge with seven arches. On the edge of that portion of the lakes which is visible from the anchorage in the bay, there is a white house, and about a quarter of a mile southward of the bridge, there are two old buildings, known as Castelli dei Turchi.

Secca Missipezza, which is rocky and has a least depth of 6 feet (1^m8) over it, and which is steep-to, lies on the coastal bank about 5 miles northward of Punta Craul and half a mile offshore. This shoal is covered by the *red* sector of Punta Craul light, between the bearings of 165° and 183° , and by the *red* sector of Torre Sant' Andrea light between the bearings of 300° and 350° .

Torre Sant' Andrea, which is square and painted in black and white chequers and has a white house near it, stands close to the coast, about 6 miles north-north-westward of Punta Craul.

Torre dell' Orso, a white truncated pyramid with its top partially ruined, and with two small houses near it, stands, elevated 52 feet (15^m8), at the head of a cove of the same name, about $1\frac{1}{4}$ miles north-westward of Torre Sant' Andrea. A rocky shoal, with a depth of 3 feet (0^m9) over it, lies about $1\frac{1}{4}$ cables north-westward of the southern entrance point of Cala dell' Orso.

Torre Rocca Vecchia, elevated 49 feet (14^m9), Torre Santa Foca, elevated 23 feet (7^m0), with some houses round it, one of which is red with a white portico, and Torre Specchia Ruggieri, elevated 16 feet (4^m9), stand, close to the coast, about three-quarters of a mile, 2 miles and 4 miles, respectively, north-north-westward of Torre dell' Orso. The coast north-westward of Torre Rocca Vecchia, nearly as far as Punta San Cataldo, is fringed in places by rocks, both above-water and sunken. See views facing this page.

Punta San Cataldo, about 9 miles north-westward of Torre dell' Orso, is sandy, with a light-tower and some houses on it; among the houses is a large bathing establishment. About a cable southward of the point, the remains of a mole extend three-quarters of a cable south-eastward and about half a cable farther south-westward; westward of this mole, there is a small boat harbour. A rocky ledge, with a depth of about 2 feet (0^m6) over its outer edge, extends a short distance eastward of the point, and the shore bank, with depths of less than 5 fathoms (9^m1) over it, is about half a mile wide off it.

The town of Lecce, which contained about 49,261 inhabitants in 1936, lies about 7 miles west-south-westward of Punta San Cataldo. Lecce is connected to the railway system. Specchia dell' Alto is situated, at an elevation of 141 feet (43^m0), about $2\frac{1}{4}$ miles south-westward of Punta San Cataldo.

Torre Veneri is situated about $2\frac{1}{4}$ miles north-westward of Punta San Cataldo (*Lat.* $40^\circ 23' N.$, *Long.* $18^\circ 19' E.$) and, about three-quarters of a mile farther north-westward, there is a conspicuous chimney standing near the coast; Torre Chianca stands about $3\frac{1}{4}$ miles north-westward of Torre Veneri, and Torre Rinaldo and Torre Specchiolla stand about 3 and $5\frac{1}{4}$ miles, respectively, farther north-west-

Charts 2701, 1440, 2158a, 2158b.

Chart 1635.

ward. Torre San Gennaro, situated $2\frac{1}{2}$ miles north-westward of Torre Specchiolla, is circular and reddish in colour; it stands on whitish ground which contrasts with the dark colour of the coast north-westward and south-eastward of it. The village of Torchiarolo stands about 3 miles west-south-westward of Torre Specchiolla.

Torre Mattarella, which is square and of a reddish colour, stands about 3 miles north-north-westward of Torre San Gennaro; there is a bight between these two towers.

- 10 Punta della Contessa lies about a mile northward of Torre Mattarella and Capo Cavallo (chart 1492), about $2\frac{1}{2}$ miles farther north-north-westward; between these two points, the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about a mile wide.

Off-lying shoals.—A rocky shoal, with a least depth of $4\frac{1}{2}$ fathoms (8^m7) over it, lies $1\frac{1}{2}$ miles north-north-eastward of Torre San Gennaro, with a similar shoal about half a mile farther north-westward.

Lights.—A light is exhibited, at an elevation of 65 feet (19^m8), from Torre Sant' Andrea, 36 feet (11^m0) in height (*Lat.* $40^{\circ} 15' N.$, *Long.* $18^{\circ} 27' E.$).

- 20 A light is exhibited, at an elevation of 84 feet (25^m6), from a pyramidal masonry tower, painted in black and white bands, 76 feet (23^m2) in height, on Punta San Cataldo.

A light is exhibited, at an elevation of 85 feet (25^m9), from a masonry structure, 49 feet (14^m9) in height, close westward of Torre Mattarella.

- 25 **Radiobeacon.**—A direction-finding radiobeacon is established about 4 miles west-north-westward of Punta San Cataldo, and 2 miles inland. For details, see Admiralty List of Radio Signals.

- Anchorage.**—Small vessels can anchor temporarily in Baia di Alimini; the best berth is about half a mile offshore, in a depth of 30 $7\frac{1}{2}$ fathoms (13^m7), northward of the outlet of the northern lake and north-eastward of the white house on the edge of the lake previously mentioned. Vessels can also anchor farther out in depths of from 10 to 13 fathoms (18^m3 to 23^m8).

- Cala dell' Orso affords anchorage for small vessels, with local knowledge, in a depth of $5\frac{1}{2}$ fathoms (10^m1), good holding ground, at a distance of about a cable offshore, with Torre dell' Orso bearing 265° .

- Small vessels can anchor south-eastward of Punta San Cataldo light-tower, in a depth of 4 fathoms (7^m3), sand, a short distance offshore, keeping Torre Veneri a little open eastward of the light-tower; here they are sheltered from northerly winds by the rocky shoal extending from Punta San Cataldo. Large vessels can anchor about a mile east-south-eastward of the light-tower and nearly the same distance offshore, in depths of from 7 to 8 fathoms (12^m8 to 14^m6), sand and weed.

- 45 Vessels can anchor south-eastward of Torre San Gennaro, in a depth of 4 fathoms (7^m3), mud and weed. There is also anchorage about a mile south-eastward of Capo Cavallo, where there is good shelter from north-westerly and offshore winds, in a depth of 3 or 4 fathoms (5^m5 or 7^m3), sand.

50 *Chart 1492.*

APPROACH TO PORTO DI BRINDISI.—Porto di Brindisi is approached between Capo Cavallo, a low projection, and Capo Gallo, on which stands Torre Penna and a light-tower, about 5 miles north-

Charts 2701, 1440, 2158a, 2158b.

Chart 1492.

westward. The port lies at the head of the bight between these two capes, and is entered between Le Pedagne light-tower, $1\frac{1}{2}$ miles north-westward of Capo Cavallo, and Punta Riso light-tower, on the head of a pier extending from the north-eastern side of Isola Sant' Andrea; 5 about a mile farther west-north-westward.

Dangers.—Beacons.—Capo Cavallo (*Lat.* $40^{\circ} 38' N.$, *Long.* $18^{\circ} 02' E.$) is bordered by a shallow rocky bank and should not be approached within a distance of $1\frac{1}{2}$ miles nor into depths of less than 15 fathoms (27^m4); a shallow bank, on which there is a rock awash, 10 lies about 2 cables eastward of this cape. Secca Capo Cavallo, with an above-water rock on its south-eastern side, is a shallow patch lying from one to $2\frac{1}{2}$ cables north-eastward of Capo Cavallo. This shoal is marked by a beacon close eastward of the above-water rock.

Secca Piatti is a shallow rocky spit extending 4 cables from the 15 northern side of Capo Cavallo; a beacon stands about 3 cables northward of the cape and close south-westward of this beacon, there is an above-water rock. A shoal, with a depth of 5 feet (1^m5) over it, lies about 2 cables east-north-eastward of this beacon and two above-water rocks lie on a shallow patch, about $1\frac{1}{2}$ cables north-westward of the 20 beacon. A 2-fathom (3^m7) rocky patch, with two other patches, having slightly greater depths over them, lying about $1\frac{1}{2}$ cables south-eastward and south-westward of it, respectively, is situated about a mile north-north-westward of Capo Cavallo. These dangers are all covered by the *red* sector of Torre Mattarella light, between the bearings of 25 153° and 185° .

Scogli delle Pedagne extend from 3 cables north-north-eastward to 6 cables north-westward of Capo Bianco, which is situated about $1\frac{1}{2}$ miles west-north-westward of Capo Cavallo. These five low above-water rocks are joined to each other and to Capo Bianco by break- 30 waters, built on the rocky bank which lies between the rocks and the cape. Passagio dei Trapanelli, an opening in the breakwaters, through which boats can pass, and which is crossed by a bridge, lies about 2 cables north-north-eastward of Capo Bianco. A bank, with depths of less than 6 fathoms (11^m0) over it, extends about a mile offshore 35 between Capo Cavallo and Pedagna Grande, the easternmost rock; on the northern side of Scogli delle Pedagne there is a similar bank, about a cable wide. A shallow rocky bank extends about a cable north-westward of Traversa, the westernmost rock.

On the western side of the approach, Secca Sant' Andrea, a rocky 40 patch, with a least depth of $5\frac{1}{2}$ fathoms (9^m6) over it, lies about $4\frac{1}{2}$ cables north-westward of Punta Riso light-tower. Depths of less than 6 fathoms (11^m0) extend about $1\frac{1}{2}$ cables northward of Isola Sant' Andrea. The light on Capo Gallo is not visible over Secca Sant' 45 Andrea.

Spoil ground.—Buoy.—A red conical buoy is moored about half a mile eastward of Capo Gallo to mark the spoil ground.

Lights.—Light-buoy.—A cylindrical light-buoy, surmounted by a pillar, exhibiting a *white flashing* light, of *three-tenths of a second* duration, *every three seconds*, is moored about $1\frac{1}{2}$ miles north-north-east- 50 ward of Capo Cavallo.

A light is exhibited, at an elevation of 69 feet (21^m0), from a white circular tower on a dwelling, 60 feet (18^m3) in height, on Scoglio Traversa. This light is known as Le Pedagne. See view on chart 1492.

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

A light is exhibited, at an elevation of 44 feet (13^m4), from a circular tower on a circular base, 32 feet (9^m8) in height, situated on the head of the pier extending north-eastward of Punta Riso.

- 5 A light is exhibited, at an elevation of 44 feet (13^m4), from a square tower, 35 feet (10^m7) in height, on Capo Gallo.

Signal station.—There is a signal station on Castello a Mare, situated half a mile south-south-westward of Punta Riso light-tower. Messages from vessels will be transmitted by telegraph. Storm signals
10 are displayed. *See* page 43.

Prohibited anchorage.—Anchorage is prohibited, in the approach to Porto di Brindisi, in an extensive area northward of an imaginary line joining Isola Sant' Andrea and Pedagna Grande. This area is indicated on the chart by pecked lines.

- 15 **PORTO DI BRINDISI.**—Porto di Brindisi is the best harbour for large vessels on the western side of the Adriatic and has been constituted a fortified naval port. The port consists of an Avamporto or roadstead, south-westward of which there are an outer and inner harbour.

- 20 Owing to the deposit brought down by the streams formed during rains, the depths in the outer and inner harbours have a tendency to become less relatively rapidly.

Pilotage.—**Tugs.**—Pilotage is optional. A vessel entering the port and requiring a pilot should display flag G of the International
25 Code of Signals, the signal station repeats this signal.

Two tugs are available.

- Avamporto.**—**Dangers.**—**Buoy.**—This roadstead is contained between the breakwater joining Capo Bianco and Scogli delle Pedagne, on its eastern side; the mainland, on its southern side; and Isola
30 Sant' Andrea, with Castello a Mare close southward of it, together with the breakwaters protecting the outer harbour, on its western side.

Avamporto is exposed to winds between north and east, and strong south-easterly winds cause a long, deflected sea; it can therefore only be used as a temporary anchorage in fine weather.

- 35 The southern and eastern sides of the roadstead are bordered by a bank, with depths of less than 6 fathoms (11^m0) over it, the extent of which can best be seen on the chart. A detached portion of this bank, with a least depth of 4½ fathoms (8^m7) over it, lies from 3 to 4 cables northward of Punta Fiume Grande, situated 8 cables west-south-west-
40 ward of Capo Bianco. A 6-fathom (11^m0) rocky patch lies about 1½ cables eastward of the northern end of this detached bank. Secca dell' Arco, with a depth of 2½ fathoms (4^m1) over it, rock, lies 3 cables north-westward of Punta Fiume Grande. This shoal is marked by a red can buoy, moored close off its northern edge.

- 45 On the western side of Avamporto, Isola Sant' Andrea and Castello a Mare are fringed by a rocky bank and depths of less than 6 fathoms (11^m0) extend about a cable offshore. A bank, with depths of 4½ fathoms (8^m2) over it, lies about 2½ cables south-south-eastward of Punta Riso light-tower (*Lat.* 40° 40' *N.*, *Long.* 17° 58' *E.*) and from one
50 to 2 cables offshore; there is a 5½-fathom (9^m6) patch close northward of the western end of this bank.

The bottom of Avamporto is chiefly rocky except in the eastern part where it is mud and good holding ground.

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

The southern breakwater protecting the outer harbour extends about 3 cables north-north-westward from a point about 4 cables westward of Punta Fiume Grande, the northern breakwater extends about a cable south-south-eastward from the southern extremity of Castello a Mare, leaving a passage about $1\frac{1}{2}$ cables wide. A shoal, with a depth of $4\frac{1}{2}$ fathoms (8^m7) over it, lies 55 yards (50^m3) south-south-eastward of the head of the northern breakwater. Masseria Zaccaria, on which there is a conspicuous mark, stands about a cable south-westward of the root of the southern breakwater. 5 10

Lights.—**Light buoy.**—A light is exhibited, at an elevation of 132 feet (40^m2), from a square iron pyramidal tower, 59 feet (18^m0) in height, on Castello a Mare (*Lat.* $40^\circ 39' N.$, *Long.* $17^\circ 58' E.$).

A light is exhibited, at an elevation of 39 feet (11^m9), from a white circular masonry tower, 24 feet (7^m3) in height, on the head of the northern breakwater. 15

A light is exhibited, at an elevation of 24 feet (7^m3), from an iron framework structure, 10 feet (3^m0) in height, on the head of the southern breakwater.

A conical light-buoy, exhibiting a *white flashing light every six seconds*, is moored about 3 cables east-south-eastward of Punta Riso light-tower. 20

Outer harbour.—**Light-buoy.**—The outer harbour is contained between Isola Sant' Andrea, Castello a Mare and the breakwaters, on its eastern side; by the mainland, on its southern and western sides; and by the breakwater joining Isola Sant' Andrea to the mainland, on its northern side. 25

Castello a Mare is connected to Isola Sant' Andrea by a bridge.

The entrance to Canale Pigionati, leading to the inner harbour, is situated at the south-western corner of the outer harbour. 30

The western side of the outer harbour is bordered by a rocky bank, with depths of less than 3 fathoms (5^m5) over it, about a cable wide. There is a patch of foul ground, with a depth of 4 fathoms (7^m3) over it, about $3\frac{1}{2}$ cables south-westward of Castello a Mare light-tower and $1\frac{1}{2}$ cables off the western shore; with this exception, the bottom within the shore banks consists of mud. The northern part of the eastern side of the harbour is bordered by a narrow, shallow bank. A bank of sand with patches of rock and weed, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over its western edge, extends about half a cable from the breakwater extending from Castello a Mare. 35 40

On the southern side of the outer harbour, Secca del Fico extends about $1\frac{1}{2}$ cables northward and $2\frac{1}{2}$ cables north-eastward from Punta Secca del Fico, situated 4 cables westward of the root of the southern breakwater; the north-western edge of this shoal, over which there is a depth of $1\frac{1}{2}$ fathoms (3^m2) and which is steep-to, is marked by a light-buoy exhibiting a *red flashing light, of half a second duration, every five seconds*. 45

The northern part, called Seno Bocche di Puglia, is completely sheltered. There is a deviation buoy in this part of the harbour. There are several landing places on the eastern side, and a pier, with depths of about 3 feet (0^m9) at its head, extends a short distance from the western side. 50

There are also several small piers and landing places near the sea-plane hangars, situated on the western side of the southern part of the harbour.

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

A large vessel, haying to remain in the outer harbour, should obtain permission from the Captain of the Port to secure to one of the mooring buoys.

- 5 **Canale Pigonati.—Lights.**—Canale Pigonati which connects the outer and inner harbours, is 328 feet (100^m0) wide, with a depth in the fairway of 32 feet (9^m7).

A light is exhibited, from a red iron framework structure, 10 feet (3^m0) in height, on the outer end of the eastern side of Canale Pigonati

- 10 (*Lat. 40° 39' N., Long. 17° 57' E.*).

A light is exhibited from a black iron framework structure, 10 feet (3^m0) in height, on the outer end of the western side of the channel.

- 15 A light is exhibited from a red and white chequered framework structure, 16 feet (4^m9) in height, on the inner end of the eastern side of the channel.

A light is exhibited from a black and white chequered framework structure, 16 feet (4^m9) in height, on the inner end of the western side of the channel.

- 20 **Inner harbour.**—This harbour is formed by two arms, one on the northern side of the town of Brindisi and the other on its eastern side. There are several mooring buoys.

- 25 The northern and western sides and most of the southern side of the northern arm are bordered by a narrow, shallow bank, the extent of which can best be seen on the chart. There are several piers and wharves on the southern side of this arm.

- The eastern shore of the eastern arm is fronted by a narrow, shallow bank, on which there are some sunken rocks, from about 1½ to 4½ cables southward of the south-eastern light-structure in Canale Pigonati.
- 30 A shallow bank fringes the western and southern sides of this arm from a position about 3 cables south-south-westward of the same light-structure; this bank, with a depth of 2½ fathoms (4^m6) over its outer edge, is about 44 yards (40^m2) wide off the point, situated 4½ cables southward of the light-structure, and about a quarter of a cable wide
- 35 at the head of the arm. It was reported, in 1939, that an area close northward of this point, about 220 yards (201^m2) long and comprised between the sides of the harbour, had been dredged to a depth of 5½ fathoms (10^m5).

- 40 The western and southern sides of the eastern arm are lined with wharves which can accommodate vessels drawing from 26 to 30 feet (7^m9 to 9^m1); the wharves on the western side are connected to the railway system.

There are some piers at the head of the eastern arm.

Port regulations.—A vessel entering must display her number.

- 45 A vessel should avoid using her steam whistle or siren as far as possible.

A vessel entering the inner harbour should, if possible, pass through the approach channel with engines stopped and at a slow speed.

- Entry and departure of a vessel into and from the inner harbour
- 50 are controlled by the Harbour authorities. A vessel is prohibited from entering Canale Pigonati while a vessel is preparing to leave the inner harbour, and must leave a clear passage for the departing vessel.

When a vessel is about to depart: by day, the flags DBZ (the

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

channel is not practicable), of the International Code of Signals, will be displayed at the signal station on Castello a Mare, until the departing vessel has passed through Canale Pigonati; at night, the information as to whether a vessel can enter or not will be transmitted "en clair" by visual signals. 5

A merchant vessel passing between the breakwaters protecting the outer harbour, must keep clear of men-of-war. A vessel departing from the outer harbour must give way to a vessel entering.

It is forbidden to take photographs or make sketches of the port or 10 Naval and Military establishments.

Prohibited areas.—Vessels are prohibited from anchoring in the outer harbour so as to obstruct the passage into or out of the inner harbour.

Steam vessels are prohibited from securing alongside the sides of 15 Canale Pigonati.

A vessel must not moor in that part of the inner harbour reserved for commercial operations in such a manner as to interfere with the movement of other vessels.

Anchorage is prohibited off the western side of the outer harbour at 20 a distance of less than 220 yards (201^m2) from the coast, between Canale Pigonati and Caprarella (*Lat.* 40° 39' N., *Long.* 17° 58' E.), about half a mile north-north-eastward.

All pleasure craft are prohibited from anchoring in the Avamporto or outer harbour; they must moor in the inner harbour as directed by 25 the Port authorities.

The western end of the northern arm, and the southern end of the eastern arm, of the inner harbour are reserved for military use.

Internal traffic and landing.—Without special permission from the Naval authority, no vessel is to approach any Naval quay or 30 property, including lighthouses, Torre Testa, Torre Vacito, Torre Mattarella, &c.

No craft of any kind is to be under way, and landing is prohibited, in various areas designated by order of the Captain of the Port, except with the special permission of the local Naval authority, which must 35 be obtained from the Harbour master's office.

Fishing.—Fishing with flares is prohibited in the inner and outer harbours, or within a distance of 2½ cables of the centre of the passage between the breakwaters protecting the outer harbour.

Fishing or dredging for shell-fish is prohibited within a distance of 40 2½ cables offshore in the vicinity of any Naval establishment.

Movements of aircraft.—**Traffic signals.**—An area on the western side of the outer harbour is reserved for the mooring of sea-planes; it extends about 110 yards (100^m6) from the coast between the 2 lights on the north-western side of the entrance to Canale Pigonati, 45 to Caprarella mole, situated about 5½ cables north-eastward. Sea-planes may land or take off in the whole of the remaining water area of the outer harbour.

The arrival, departure or military exercises of aircraft in the outer harbour will be indicated by the following signals:— 50

Signal.	Meaning.
By day.—A white and green flag displayed at the signal station at Castello a Mare.	Military exercises by aircraft are taking place.

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

	Signal.	Meaning.
5	<i>By day.</i> —A green flag displayed at the signal station at Castello a Mare and a similar flag displayed on the flagstaff at the aerodrome on the western side of the outer harbour.	Civil aircraft are arriving or departing. The flags will be hauled down on completion of the manœuvre.
10	<i>At night.</i> —Three red lights, disposed vertically, exhibited at the signal station at Castello a Mare and also in front of the aerodrome.	Movements of vessels are suspended.

When the above signals are shown, vessels about to leave the inner harbour, or enter the outer harbour, should not get under way or enter until the signals are hauled down or switched off; when military exercises by aircraft are in progress, vessels may leave the inner harbour, or enter the outer harbour, provided that the utmost caution is exercised.

When there are vessels already under way in the harbour, or in the entrance, aircraft will delay their departure or arrival until the area is clear.

Vessels passing through the outer harbour must reduce speed so as to avoid damage to seaplanes which may be moored there.

Boats of all kinds, and tugs which have not an excessive weight in tow, must always leave room for the manœuvres of aircraft.

For the use of seaplanes alighting or taking off at night a number of light-boats are moored in the outer harbour; they are secured to a cable which is moored at one end and the direction of which varies with the direction of the wind; the light-boats will be moored in a position which will not obstruct vessels entering or leaving the port. During easterly or north-easterly winds, the light-boats will be moored southward of Secca del Fico. The light-boats will be placed in position 30 minutes before the anticipated time of arrival of the aircraft and will be removed immediately after her arrival; they may remain in position up to one hour after the departure of a seaplane.

During night flying by military aircraft, the light-boats will be moored parallel with the outer mole, leaving the entrance to the harbour clear.

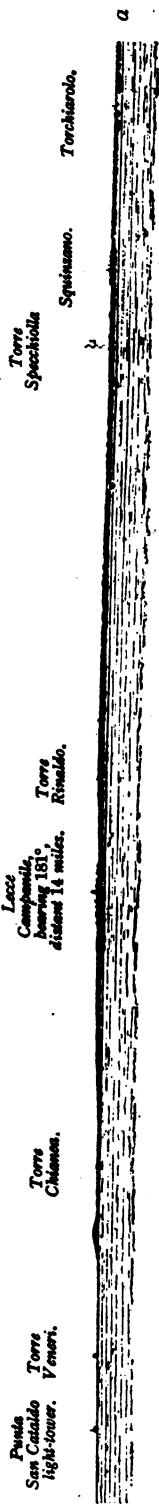
Charts 1492, 1632, 1635.

Directions.—The land in the neighbourhood of Porto di Brindisi is very low and sometimes difficult to identify, especially during southerly winds, when it becomes obscured. Between Porto Otranto and Porto di Brindisi (*Lat. 40° 39' N., Long. 17° 57' E.*) depths of from 50 to 55 fathoms (91^m4 to 100^m6) are found about 5 miles from the coast until 8 or 10 miles south-eastward of Capo Cavallo, when the depths become somewhat less. On nearing Porto di Brindisi, the bottom is weedy off Capo Cavallo; hard mud off Capo Gallo; and between Capo Gallo and Capo Cavallo, rock, sand or gravel.

The campanile of Lecce cathedral is the only object which can be distinguished from a distance eastward or south-eastward. From northward or north-eastward Torre Penna on Capo Gallo is the first object seen on this low coast, which otherwise is not visible beyond a distance of 7 or 8 miles. In the vicinity of the harbour the most con-

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

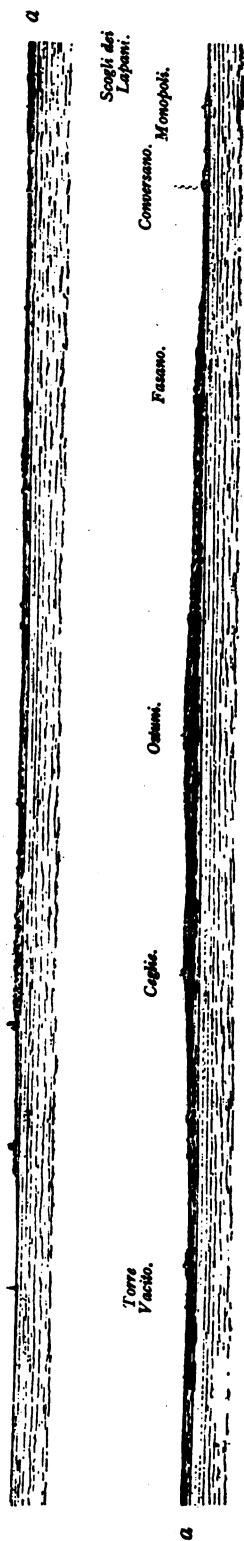
To face page 523.



View in 2 parts of coast from Punta San Cataldo to Torre Penna.

(Original dated 1899.)

Castello
a Mare
bearing 158°, Monument
distant 8 miles, Brindisi.



View in 2 parts of coast from Brindisi to Monopoli.

(Original dated 1899.)

Charts 1492, 1632, 1635.

spicuous objects are :—Four square buildings situated near the shore, two northward and two southward of the harbour, each over 100 feet (30^m5) high ; Scogli delle Pedagne lighthouse ; Castello a Mare.

See views on chart 1492 and facing this page.

5

From south-eastward.—A vessel approaching from south-eastward, in order to avoid the shallow bank extending from Capo Cavallo, should pass eastward and northward of the light-buoy moored north-eastward of that cape, and keep in a greater depth than 14 fathoms (25^m6). When the light-tower on the northern breakwater protecting 10 the outer harbour bears 242°, and is well open north-westward of Le Pedagne light-tower, she may steer for the former on that bearing, passing about 3 cables north-westward of Le Pedagne light-tower, and then alter course as necessary.

At night, a vessel will avoid the shallow bank extending from Capo Cavallo by keeping Torre Mattarella light bearing more than 207°, showing white.

From north-westward.—A vessel, after passing Capo Gallo, should give Secca Sant' Andrea and the 4½-fathom (8^m2) bank lying eastward of Isola Sant' Andrea a good berth, and then alter course south-west- 20 ward as necessary to pass midway between the breakwaters protecting the outer harbour.

Chart 1492.

Quarantine regulations.—Vessels entering the port from abroad after sunset and not desiring to obtain pratique immediately, should 25 anchor in the Avamporto or outer harbour and hoist a red light.

Vessels entering the port from abroad after sunset and desiring to obtain pratique immediately, are to hoist a red light, and may enter the inner harbour.

The red light is always to be kept hoisted until pratique has been 30 granted by the proper officer.

Deratisation.—See page 50.

Town.—Brindisi contained about 36,000 inhabitants in 1939. It is the see of an Archbishop. At the north-western corner of the ancient wall, which partly surrounds the town, is the old Genoese castle flanked 35 by huge round towers and conspicuous from all sides.

Consular Officer.—A British Consular Officer resides in Brindisi (Lat. 40° 38' N., Long. 17° 57' E.).

Communications.—Brindisi is connected to the general railway system and connected with Shëngjin, in Albania, by submarine tele- 40 graph cable.

There is frequent steamer communication with Italian ports and regular steamer communication with various foreign ports.

There is a Radio station ; see page 46.

Trade.—The principal exports are wine, fish, tobacco and fruit ; 45 the imports are coal, flour, copper, sulphate and timber.

Port facilities.—Small quantities of coal and fuel oil can generally be obtained. The Italian government maintains a stock of 10,000 tons of coal.

Water is laid on to the wharves and can also be obtained in 20-ton 50 lighters which are not fitted with pumps.

There is a naval hospital which can accommodate from 100 to 150 patients, and an isolation wing with from 30 to 40 beds.

Fresh provisions are plentiful.

Charts 1632, 1635, 2701, 199, 1440, 2158a, 2158b.

Chart 1492.

Repairs to hull, machinery and boilers can be executed.

There is a floating dock, for details of which *see* App. I, page 602.

There are two 10-ton cranes, one of which is a floating crane.

- 5 *Meteorological tables.*—*See* page 31.

Chart 199.

COAST.—**General remarks.**—Between Brindisi and Testa del Gargano, 107 miles north-westward, the coast is generally low; Promontorio del Gargano, the high land close westward of Testa del Gargano, is the only mark for vessels making the land until about 10 miles offshore, when in clear weather the towns, villages and towers scattered along the coast may be distinguished. *See* views facing pages from 523 to 539.

Between Brindisi and Barletta, about 87 miles west-north-westward, there are a number of towns, and each has a small port frequented by coasting vessels. At Monopoli, the first of these ports, the flat country disappears, and the land maintains a moderate elevation, with patches of cultivation, to near Barletta, beyond which, as far as Manfredonia, sandy marshes prevail. This coast may be safely navigated at a distance of from one to $1\frac{1}{2}$ miles.

Anchorage.—In fine weather, with offshore winds, even large vessels may temporarily anchor about $1\frac{1}{2}$ miles off the coast, in depths of from 17 to 18 fathoms (31^m1 to 32^m9), hard mud.

Although the harbours on this coast are accessible to small craft only, there are tolerable summer anchorages abreast some of them.

Chart 1632.

Coast.—The towns of Carovigno and Ostuni, situated 12 and 16 miles, respectively, west-north-westward of Capo Gallo (*Lat.* $40^{\circ} 41' N.$, *Long.* $17^{\circ} 56' E.$), and about 4 miles inland, are good marks when making the land between Brindisi and Monopoli. Carovigno is elevated 590 feet (179^m8) and is white in appearance; Ostuni, the larger, is elevated 751 feet (228^m9). *See* view facing this page.

Torre Testa, which is square, is situated, at an elevation of 23 feet (7^m0), about 3 miles westward of Capo Gallo. Torre Vacito, which is square with a frieze of arches on the top, is situated, at an elevation of 26 feet (7^m9), about $3\frac{1}{2}$ miles west-north-westward of Torre Testa. Torre Santa Sabina, which is a squat, reddish building backed by light-coloured sandhills and luxuriant olive trees, is situated, at an elevation of 20 feet (6^m1), about 5 miles farther west-north-westward; and Torre Pozzelli about 2 miles farther in the same direction.

Scogli dei Lapani are low blackish rocks, 2 miles west-north-westward of Torre Testa and half a mile from the shore, with which they lie parallel; Scogli Vacito, similar rocks, lie between them and Torre Vacito. *See* views facing this page and page 523.

Torre Villanova, which is reddish, with a whitish column on it resembling a lighthouse, is situated, at an elevation of 10 feet (3^m0), about 19 miles from Brindisi and northward of the hill on which the town of Ostuni is situated; the place is visited by small craft only, which anchor close to the shore near the tower. A road connects the tower with Ostuni, the dark-coloured church steeple of which is on the western side of the town and rises little above the other buildings.

Torre San Leonardo, which is not remarkable, is situated at an elevation of 7 feet (2^m1), about $2\frac{1}{2}$ miles west-north-westward of Torre

Charts 199, 1440, 2158a, 2158b.

To face page 524.

San Vito de Normanetti.

Cagliari. Caronigno.

Soggi Vacito. Torre Vacito.

Ostuni.

Monopoli.

Conversano.

Fasano.

View in 2 parts of coast from Torre Vacito to Monopoli.

(Original dated 1910.)

a a

Chart 1632.

Villanova ; Punta Torre Canne, on which there is a light-tower, is situated about 4 miles west-north-westward of Torre San Leonardo. The houses of the town of Fasano, about 5 miles westward of Punta Torre Canne, show conspicuously as a thin white stripe, among the dark green olive trees, half-way up a flat-topped hill with scattered white houses on it.

See view facing page 524.

About $4\frac{1}{2}$ miles north-westward of Punta Torre Canne are the ruins of Torre Egnazia, and of the ancient town of that name ; Torre Cindola is situated about $2\frac{1}{2}$ miles farther north-westward and there is a creek close to it frequented by boats. Between this tower and Torre Egnazia boats can haul up on the shore, a convenience not afforded within 4 or 5 miles northward of Torre Cindola.

Torre San Stefano is a mile beyond Torre Cindola ; at San Stefano there is a small inlet, available for fishing boats, which may be distinguished by a large white edifice on a height close to the sea.

Light.—A light is exhibited, at an elevation of 115 feet (35^m0), from a white octagonal masonry tower on a dwelling, 105 feet (32^m0) in height, on Punta Torre Canne (Lat. 40° 50' N., Long. 17° 28' E.).

Chart 199, plan of Monopoli.

Porto di Monopoli.—**Buoy.**—This harbour, situated about 10 miles north-westward of Punta Torre Canne, is formed by two moles, by which it is well sheltered. Strong north-easterly and easterly winds sometimes make entrance difficult ; the holding ground is bad.

The southern mole extends a cable northward from the castle, situated on the northern side of the eastern part of the town of Monopoli, and forms the eastern side of the harbour. The northern mole extends in a north-easterly direction offshore for about $1\frac{1}{2}$ cables and then in a south-easterly direction for about $1\frac{1}{2}$ cables. The entrance between the two moleheads is about a cable wide.

There are four coves in the harbour ; Cala Curatori, the north-westernmost, is separated from Cala delle Fontanelle, about $1\frac{1}{2}$ cables southward, by Punta del Trave. Between Cala delle Batterie, about three-quarters of a cable south-eastward of Cala delle Fontanelle, and Cala del Porto, the south-easternmost, there is a quay, known as Banchina della Solfatara.

The western side of the northern part of the harbour is occupied by a rocky bank, with depths of less than 3 fathoms (5^m5) over it. Between the eastern edge of this bank and the southern molehead, there is a narrow passage to the southern part of the harbour ; in the fairway of this passage, there are depths of $5\frac{1}{2}$ fathoms (10^m5). A narrow, shallow bank extends from the western side of the southern mole.

Banchina della Solfatara is the main quay for cargo vessels. The quay wall is about 6 feet (1^m8) high. The north-eastern side is 325 feet (99^m1) long, with a depth of 23 feet (7^m0) alongside ; on the north-western side of the quay, there is a berth, 150 feet (45^m7) long, with a depth of 15 feet (4^m6). At the south-western end of this berth,



*Punta Torre Canne
light-tower.*

15

20

25

Charts 1632, 199, 1440, 2158a, 2158b.

Chart 199, plan of Monopoli.

a rocky ledge, with a depth of 7 feet (2^m1) over it, projects from the wall.

- The heads of both Cala delle Batterie and Cala del Porto are shallow, and a dangerous above-water rock lies a short distance off the western side of the latter cove, about 1½ cables southward of the light-tower on the southern molehead.

- The northern mole carries a pipeline from the bulk tanker berth near its head, to the storage near the root of the mole. The quay is built of concrete blocks which prevent the tanker berthing close alongside. There are two small wooden jetties carrying the connections, and there is a depth of 22 feet (6^m7) off the end of the inshore jetty.



*Southern mole light-tower
Porto di Monopoli.*

The harbour affords shelter to small vessels, which generally anchor close in, with a stern warp to the shore. In fine weather, large vessels may anchor outside the moles.

See view facing this page.

Pilotage.—Pilotage is compulsory. Pilots board vessels outside the harbour.

Lights.—A light is exhibited, at an elevation of 49 feet (14^m9) from a tower with

an octagonal base, 46 feet (14^m0) in height, on the southern molehead.

- See view.*

A light is exhibited, at an elevation of 41 feet (12^m5), from a column on an iron framework structure, 34 feet (10^m4) in height, on the northern molehead. *See view.*

- Town.**—Monopoli is connected to the railway system, and contained, in 1939, about 18,100 inhabitants. It is surrounded by walls, the outer portion of which are washed by the sea; a castle stands at the north-eastern corner.

- The principal exports are wine, oil, dried and fresh fruits, lime and cement; the imports are sulphur, grain, woven articles, coffee, timber and clay.

There is regular steamer communication with other Italian ports.

- Port facilities.**—Small quantities of coal may sometimes be obtained, either at the quay or at anchor. There are usually about 7,000 tons of fuel oil in stock.

Small quantities of fresh provisions can be procured.

There is a hospital available for seamen.

- Chart 1632.*

Coast.—From Monopoli the coast trends about 11 miles north-westward to Mola di Bari.

- Torre dell' Orto stands about 1½ miles north-westward of Monopoli, and Torre Incina, which is conspicuous, about a mile farther north-westward. Isolotto San Paolo (*Lat. 41° 00' N., Long. 17° 14' E.*), a rocky islet close inshore, and on which stand the ruins of a monastery, is situated about 1½ miles north-westward of Torre Incina.

Polignano, a town which contained about 9,250 inhabitants, in 1939, lies about three-quarters of a mile westward of Isolotto San



*Northern mole
light-structure
Porto di Monopoli.*

Charts 199, 1440, 2158a, 2158b.



Monopoli from north-eastward, distant half a mile.

(Original dated 1939.)



Monopoli.

Polignano.



Torre Rapagnola.

Conversano,
bearing 199°, distant
8½ miles.

View in 2 parts of coast from Monopoli to Conversano.

(Original dated 1910.)

Chart 1632.

Paolo, on a steep craggy rock, surrounded by olive trees, with several chimneys rising among the houses; at the foot of the rock, there is a cave. There is a small harbour here suitable only for boats.

San Vito abbey, a high and massive building, $1\frac{1}{2}$ miles north-westward of Polignano, is conspicuous; Torre Rapagnola, low and square, stands on a projecting point, about $1\frac{1}{2}$ miles farther north-westward. The town of Conversano stands, at an elevation of 787 feet (239^m9), about 4 miles south-westward of this tower. The town of Mola di Bari is situated about 4 miles north-westward of Torre Rapagnola. See 10 views facing page 526.

Chart 199, plan of Mola.

Porto Mola di Bari.—Light.—This harbour is formed by a mole which has two elbows, and extends about $2\frac{1}{4}$ cables eastward from the northern end of the town, and by a straight mole, extending about 15 three-quarters of a cable north-north-eastward from the south-eastern part of the town. In 1939, an area westward of the head of the northern mole was dredged to a depth of 17 feet (5^m2). The head of the northern mole should be given a berth of about 40 yards (36^m5). See 20 view facing page 528.

A light is exhibited, at an elevation of 40 feet (12^m2), from a column on an iron framework pyramidal structure, 33 feet (10^m1) in height, on the northern molehead (*Lat. 41° 04' N., Long. 17° 06' E.*).

Mola di Bari contained about 19,500 inhabitants, in 1939; it stands close to the sea on low land and may be distinguished by its cathedral, 25 which has a square, dark belfry, and by two conspicuous white steeples. The town is connected to the railway system. Small quantities of fresh provisions can be obtained.

Chart 1632.

Anchorage.—In fine weather, vessels can anchor, in a depth of 30 $5\frac{1}{2}$ fathoms (10^m1), hard mud, at a distance of half a mile off the town, or farther off as convenient.

Coast.—Between Mola di Bari and Bari, 11 miles north-westward, the coast is bordered by rocks and presents no remarkable features, except Torri Pelosa and Carnosa, which are situated about 5 and 35 8 miles, respectively, north-westward of Mola di Bari. The village of Torre Pelosa is round the tower of that name, which is square, with windows at the top; the tower is difficult to identify from seaward against the houses. Torre Carnosa is low, dark and pyramidal, it stands at an elevation of 10 feet (3^m0). Seno di San Giorgio lies 40 between these two towers, and half a mile north-westward of its entrance is Secca Punta d'Oro, with a depth of $1\frac{1}{2}$ fathoms (2^m7) over it, situated about 2 cables offshore. There is anchorage for small vessels, with local knowledge, off Seno di San Giorgio.

A shoal, with a depth of $3\frac{1}{2}$ fathoms (6^m4) over it, was reported, in 45 1945, to lie about three-quarters of a mile northward of Torre Carnosa. A detached 6-fathom (11^m0) patch lies about $1\frac{1}{2}$ miles north-westward of Torre Carnosa and about a mile offshore.

Chart 199, plan of Bari.

BARI.—This town stands on a low projection. It has two har- 50 bours, but the south-eastern one is little used. It is easily identified, from eastward, by two steeples, the higher of which is a square brown tower, surmounted by a small steeple, situated on the cathedral, and

Charts 199, 1440, 2158a, 2158b.

Chart 199, plan of Bari.

by the lighthouse on Punta San Cataldo, situated on the north-western side of the northern harbour; from north-eastward, by a cluster of six chimneys, situated about half a mile southward of Punta San Cataldo; and from northward, by the castle with its black signal tower. Other conspicuous buildings are the new theatre in the western part of the town, with its large dome, and the large square building of the Chamber of Commerce. See view facing this page:

Pilotage.—Pilotage is compulsory. Pilots board vessels outside the harbour.

Porto Vecchio.—**Danger.**—**Buoy.**—Porto Vecchio is situated south-eastward of the town of Bari, and is small and shallow; it is protected, on its northern side, by Molo Sant' Antonio, which projects about 3 cables eastward and south-eastward, and, on its southern side by Molo San Nicola, which extends about a cable north-eastward from, the coast. The entrance, which is open southward, is about 2 cables wide between the heads of these two moles.

The harbour is difficult of access in strong northerly or in easterly winds, and is only used by fishing boats.

A vessel entering Porto Vecchio must take care to avoid Secca del Monte, locally known as Secca Sant' Antonio, which is rocky and almost awash, and which breaks in heavy weather. This shoal lies from 2 to 2½ cables northward of the head of Molo Sant' Antonio, and is marked, on its northern side, by a white conical buoy. The light on the head of Molo Sant' Antonio is obscured over Secca del Monte between the bearings of 120° and 180°.

Light.—A light is exhibited, at an elevation of 55 feet (16^m8), from a circular masonry tower on a quadrangular base, 46 feet (14^m0) in height, situated on the head of Molo Sant' Antonio (*Lat.* 41° 08' N., *Long.* 16° 53' E.).

Porto Nuovo.—This harbour is protected on its eastern and northern sides by Nuovo Molo Foraneo, which extends about 4 cables northward from the north-eastern part of the town, then about 3 cables north-westward, and then about 5 cables westward; Molo Luigi Razza, extending about 3 cables north-eastward from Punta San Cataldo, partly protects the harbour from north-westward. The entrance between the heads of these two moles is about 2 cables wide.

Vecchio Molo Foraneo extends 2½ cables north-westward from the root of Nuovo Molo Foraneo and then 2 cables westward. Between the roots of these two moles and for some distance along them there are quays. Molo di Ridosso extends 2 cables northward from the elbow of Vecchio Molo Foraneo. Molo Pizzoli extends 3 cables north-north-eastward from the western part of the town, its head being situated about 2 cables south-south-eastward of that of Vecchio Molo Foraneo. Pontile San Vito extends about a cable north-westward nearly midway between these two moles. The inner side of Vecchio Molo Foraneo is lined with quays which extend south-westward, in front of the town, to Pontile San Vito, which has quays on both sides and at its head. A mole projects about a cable north-eastward from the north-eastern corner of the quay situated midway between Pontile San Vito and Molo Pizzoli, forming a narrow, shallow basin. There is a quay along the eastern side of Molo Pizzoli. The Customs house and Harbour master's office are situated close north-eastward of the root of Pontile San Vito. Vecchio Molo Foraneo, Pontile San Vito and Molo Pizzoli

Charts 1632, 199, 1440, 2158a, 2158b.



Madonna di Loreto
spire, bearing 240°, distant
half a mile.

(Eastern portion
of mole not
shown.)

Mola di Bari.

(Original dated 1910.)

Bari.

San' Antonio.

Cathedral.

Signal station.



Barracks.

Entrance to
Porto Vecchio.

Buoys of
Secca del Monte
(removed).

Mole.

Li. Ho. on
Punta San Calallo,
bearing 275°,
distant 2½ miles.

Bari.

(Original dated 1910.)

Chart 199, plan of Bari.

are connected to the railway system. There are several mooring buoys in the harbour.

Vessels have to keep 6 feet (1^m8) off the southern and south-western sides of Vecchio Molo Foraneo on account of the narrow shoal at its foot, and also on account of the swell. In 1937, there were depths of from 3½ to 4½ fathoms (6^m4 to 8^m2) a short distance off the southern side of the outer part of this mole and depths of from 4 to 5 fathoms (7^m3 to 9^m1) a short distance off the south-western side of its inner part. Alongside the quay between Vecchio Molo Foraneo and Pontile San Vito there were depths of about 2½ fathoms (4^m6); at the head of Pontile San Vito, there were depths of 2½ fathoms (5^m0), along its north-eastern side, from 3½ to 2½ fathoms (5^m9 to 4^m1), and along its south-western side, from 2 to 2½ fathoms (3^m7 to 4^m1). Along the eastern side of Molo Pizzoli, in the same year, there were depths of from 1½ fathoms (3^m2), at its outer end, to one fathom (1^m8), at its inner end; at a distance of three-quarters of a cable southward of the head of this mole, and close off its eastern side, there was a rocky patch with a depth of 3 feet (0^m9) over it.

Westward of Molo Pizzoli, the light on its head is not visible bearing less than 100°; eastward of the mole, the same light is not visible bearing more than 310°.

There are berths for large vessels along the inner side of Nuovo Molo Foraneo from the elbow, situated 5 cables from its head, to its root; along the north-eastern side of Vecchio Molo Foraneo; and along the eastern side of Molo di Ridosso. Vessels are also berthed, stern-to, southward of the outer portion of Nuovo Molo Foraneo.

There is a berth, with a depth of 29 feet (8^m8), at the seaward end of Molo Luigi Razza.

Lights.—A light is exhibited, at an elevation of 218 feet (66^m4), from a white octagonal tower, 205 feet (62^m5) in height on Punta San Cataldo (*Lat. 41° 08' N., Long. 16° 51' E.*). See view.

A light is exhibited, at an elevation of 49 feet (14^m9), from an iron framework pyramidal structure, 32 feet (9^m8) in height, on the head of Molo Luigi Razza.

A light is exhibited, at an elevation of 49 feet (14^m9), from a grey iron pyramidal structure, 26 feet (7^m9) in height, on the head of Nuovo Molo Foraneo.

A light is exhibited, at an elevation of 49 feet (14^m9), from a masonry tower on a dwelling, 41 feet (12^m5) in height, on the head of Vecchio Molo Foraneo.

A light is exhibited, at an elevation of 30 feet (9^m1), from a masonry tower, 20 feet (6^m1) in height, on the head of Molo Pizzoli.

Two lights, disposed vertically, are exhibited on the head of Pontile San Vito.

Signal station.—A signal station, consisting of a black square tower, is situated on the castle, about 3 cables southward of the head of Pontile San Vito. This station is connected to the telegraph system and will transmit messages received from ships.

Anchorage.—The only good anchorage within the harbour is with the light-tower on the head of Molo Pizzoli in line with that on

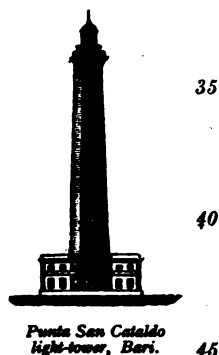


Chart 199, plan of Bari.

Vecchio Molo Foraneo, bearing about 170° , at a distance of about 2 cables from the latter.

Chart 1632.

- 5 Vessels can anchor at a distance of about $6\frac{1}{2}$ cables north-westward of Capo San Cataldo light-tower, in a depth of 9 fathoms (16^m5).

Chart 199, plan of Bari.

- Prohibited area.**—Anchoring and fishing is prohibited in an area extending 4 cables north-north-westward of a line drawn in an east-
10 north-easterly direction from Capo San Cataldo light-tower to Nuovo Molo Foraneo. This area is indicated on the chart by pecked lines.

- Movements of aircraft.—Regulations.**—The area reserved for the taking off and alighting of aircraft is between Molo Pizzoli and Punta San Cataldo. If this area is impracticable on account of the
15 weather, aircraft may make use of Porto Vecchio.

Arrival and departure of aircraft will, if possible, be signified by a green flag displayed at the Signal station.

- While this signal is displayed, no vessel may carry out any manœuvre connected with departure or arrival. If, on the contrary, a vessel is
20 already moving, the aircraft must wait until the area is completely clear.

All craft, including pulling boats and tugs which have not an excessive weight in tow, must always leave room for aircraft when they are manœuvring.

- 25 **Directions.**—In strong northerly winds, a vessel is recommended to obtain sufficient offing to enable her to approach the harbour on a south-easterly course. When the anchor is dropped she should be proceeding at a slow speed and the cable should not be checked suddenly as the bottom is rocky beneath a light covering of mud and sand.

- 30 The holding ground is not good in the area contained between the inner arm of Vecchio Molo Foraneo and the Harbour master's office, and with north-westerly winds there is a danger of dragging the anchor.

- Town.**—Bari, which contained about 162,240 inhabitants, in 1939, is the most important town of the province of Puglia. See view facing
35 page 528.

Trade.—The exports are wine, oil, dried figs, almonds, soap, cement, dressed skins, and canned tomatoes. The imports are coal, cereals, wrought iron, cloth, timber, marl, and raw hides.

- Communications.**—Bari is connected to the general railway
40 system.

There is regular steamer communication with Italian and various foreign ports.

Port facilities.—A small quantity of coal is usually kept in stock. Fresh provisions are plentiful and water is laid on to the moles.

- 45 Minor repairs to machinery can be executed.

There are a military and a civil hospital, each with 200 beds.

Deratisation.—See page 50.

Chart 199.

- COAST.—Light.**—Between Punta San Cataldo (*Lat.* $41^\circ 08' N.$,
50 *Long.* $16^\circ 51' E.$) and the town of Molfetta, 12 miles west-north-westward, the following are conspicuous:—the white tower at the village of San Spirito, about $4\frac{1}{2}$ miles west-north-westward of Punta San Cataldo; the belfry at the town of Modugno, about 5 miles south-

Charts 1440, 2158a, 2148b.

To face page 531.

Church. Lighthouse.



Bari.

Pulse.

San Spirito.

Coast from Bari to San Spirito.
(Original dated 1910.)



Giovinazzo.

Terlizzi.

Ruvo.

Castel del Monte.

a a

Molfetta.
Lt. Ho.,
bearing 225°, distant 7½ miles.

View in 2 parts of coast including Giovinazzo and Molfetta.
(Original dated 1910.)

Terlizzi.



Seminary
towers.

Lighthouse,
bearing
172°, distant
half a mile.

Harbour
entrance.

Molfetta.

(Original dated 1910.)

Chart 199.

westward of Bari ; and the town of Giovinazzo, about 4 miles west-north-westward of San Spirito. This town stands on a steep cliff, with a church having two brownish steeples of unequal height. *See view facing this page.* 5

There is a cove close westward of the tower at San Spirito ; a mole extends about a cable north-westward from the eastern entrance point of this cove.

A light is exhibited, at an elevation of 19 feet (5^m8), from an iron column on the head of the mole at San Spirito. 10

Close north-westward of Giovinazzo there is a creek which is frequented by coasting vessels. A shoal, with a depth of 2½ fathoms (4^m6) over it, lies close off the eastern entrance point of this creek. In fine weather, a vessel may anchor a short distance north-westward of Giovinazzo, about 2½ cables offshore, in a depth of 13 fathoms (23^m8) 15 good holding ground.

Chart 199, with plan of Molfetta.

MOLFETTA.—This town contained about 48,900 inhabitants, in 1939. The most conspicuous objects are the two quadrangular towers of an ancient seminary, situated at the root of the eastern mole, and the church of Madonna dei Martiri, which has a quadrangular belfry and stands isolated on the shore, about three-quarters of a mile west-north-westward of the seminary. *See view facing this page.* 20

The harbour, situated on the northern and western sides of the town, is protected from all but strong north-westerly winds by an eastern mole of irregular form about 4½ cables long, extending in a north-westerly direction, and by a western mole about 1½ cables long, extending in a north-north-easterly direction from the shore, about 3½ cables westward of the root of the eastern mole. There is a landing place south-eastward of the latter mole. 25 30

Danger.—Beacons.—Secca San Domenico, a rocky ledge about a cable long, partly above water, lying parallel with and about a cable off the shore, lies with its north-western end about half a cable south-south-eastward of the head of the western mole. Its north-western end is marked by a white truncated pyramidal stone beacon, with a square base, 11 feet (3^m4) high, and its south-eastern end is marked by a light-structure. 35

Chart 199, plan of Molfetta.

Dredged area.—An area southward and eastward of Secca San Domenico, indicated on the chart, was dredged, in 1939, to a depth of 16 feet (4^m9). In 1944, this area was reported to be silting. 40

Lights.—A light is exhibited, at an elevation of 66 feet (20^m1), from a white octagonal tower on a circular dwelling, 60 feet (18^m3) in height, near the middle of the eastern mole (*Lat. 41° 12' N., Long. 16° 36' E.*).

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a masonry hut, 15 feet (4^m6) in height, on the head of the eastern mole. 45

A light is exhibited, at an elevation of 16 feet (4^m9), from an iron framework structure, 10 feet (3^m0) in height, on the head of the western mole. 50

A light is exhibited, at an elevation of 11 feet (3^m4), from an iron framework structure on a concrete base, 8 feet (2^m4) in height, situated on the south-eastern end of Secca San Domenico.

Charts 1440, 2158a, 2158b.

Chart 199, plan of Molfetta.

Pilotage.—A local licensed pilot is available, by request.

Winds.—Winds from the north-eastern quadrant cause no trouble to small vessels moored at the head of the harbour. In summer, 5 westerly winds prevail at night, and easterly and east-south-easterly winds during the day.

It is said that a covering of white clouds on Promontorio del Gargano is a sign that northerly winds are blowing in the northern Adriatic; if the promontory is clear it is often a sign of probable south-easterly 10 winds. *See also page 16.*

Directions.—A large vessel, when entering, should keep as close as possible to the eastern mole.

Town.—Molfetta contained about 48,900 inhabitants in 1939. The principal exports are oil, wine, almonds, sweets, bricks, sulphate of 15 carbon, &c. The imports are timber for building, and coal.

There is a civil hospital with 42 beds.

Molfetta is connected to the general railway system and has steamer communication with other ports in the Adriatic.

Chart 199.

20 **COAST.**—From Molfetta, the coast trends 4½ miles west-north-westward to the town of Bisceglie. Seno il Sanso, about a mile north-westward of Molfetta, only affords shelter to boats in offshore winds. Torre Calderino, white and conspicuous, stands on the coast about half way between Molfetta and Bisceglie.

25 Castel del Monte (chart 1440), 1,772 feet (540^m1) high, stands isolated about 14 miles south-westward of Bisceglie; this castle appears quadrangular from seaward and is one of the best marks on this stretch of coast to beyond Barletta. *See views facing pages 531, 533.*

Chart 199, plan of Bisceglie.

30 **Bisceglie.**—**Lights.**—The harbour of Bisceglie consists of a small bay, sheltered from easterly and southerly winds by a mole extending about a cable north-north-westward from its eastern entrance point, and partially protected from northerly winds by a mole extending about 1½ cables eastward from the coast a short distance north-westward of 35 the western entrance point of the bay; in 1937, the head of this mole was in ruins and a vessel should give the light-structure, near its head, a berth of not less than 55 yards (50^m3). A reef extends a short distance from the head of the southern mole which must also be given a berth of at least 55 yards (50^m3).

40 A light is exhibited, at an elevation of 36 feet (11^m0), from a post on a grey circular hut, 14 feet (4^m3) in height, on the head of the southern mole (*Lat. 41° 15' N., Long. 16° 31' E.*).

A light is exhibited, at an elevation of 16 feet (4^m9), from a column situated close westward of the ruined head of the northern mole.

45 The harbour has quays around the south-eastern part, but only vessels of very shallow draught can make use of them.

Steamers can anchor, in fine weather, north-eastward of the southern molehead, approaching it according to their draught. Small craft anchor between Scoglio La Cassa, which lies near the middle of the 50 harbour and on which there is a massive stone mooring bollard, and the mole north-eastward, with chains to the bollard and the shore.

Southward of Scoglio La Cassa, the harbour is very shallow. The

Charts 1440, 2158a, 2158b.

Ruvo.

Culthral.

Terlizzi.

Tower
bearing 173° , distant
one mile.

Harbour
entrance.

Bisceglie.
(Original dated 1910.)



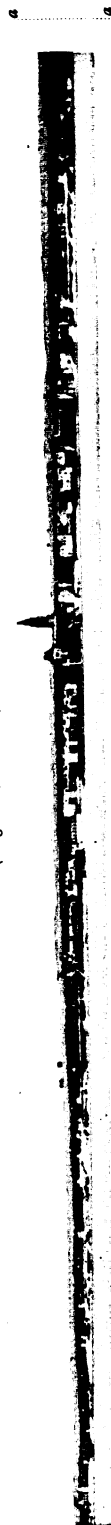
Bisceglie.



Trani,
bearing 208° , distant
13 miles.

Barletta.

View in 2 parts of coast from Bisceglie to Barletta.
(Original dated 1910.)



Cathedral
bearing 180° ,
distant $1\frac{1}{2}$ miles.

Castle.

Trani Harbour
entrance.

Andria.

Castel del Monte.

Colonna
convent.



View in 2 parts of Trani and adjoining coast.
(Original dated 1910.)

Chart 199, plan of Bisceglie.

harbour is constantly silting and dredging takes place periodically. Winds between north and east-north-east cause a surf.

The town of Bisceglie may be distinguished by the twelfth century cathedral (*Lat. 41° 14' N., Long. 16° 30' E.*) which shows, when seen from the offing, a large conspicuous whitish cupola, and by a castle with a dark square tower; it contained about 32,600 inhabitants, in 1939. Oil, wine and fruit are exported and coal and salt fish are imported. There is a civil hospital with 20 beds.

Bisceglie is connected to the general railway system and has regular steamer communication with other ports.

See view facing this page.

Chart 199.

Coast.—Between Bisceglie and the town of Trani, 4½ miles west-north-westward, the coast is of little elevation, rocky and broken, sloping steeply to a narrow sandy beach. Torre Lama Paterna, about 2 miles west-north-westward of Bisceglie, with a conspicuous viaduct on masonry arches behind it, can be distinguished by the house standing above it. Punta Colonna, about 1½ miles farther west-north-westward, is relatively high and rocky and is surmounted by a large whitish convent of the same name on which there is a small belfry.

The town of Andria, situated 6 miles west-south-westward of Trani and 5 miles inland, is conspicuous from seaward; it is elevated 495 feet (150^m9) and has three large steeples.

See views facing this page.

Chart 199, plan of Trani.

Trani.—The town of Trani can be identified by the cathedral with its quadrangular belfry, situated on an eminence on the western entrance point of the harbour and by the castle with its two square towers, one at each end; *see view facing this page.*

The population of Trani was about 30,000, in 1939. The exports consist chiefly of alcohol and wrought stone; the imports of timber, flour, coal, woven goods, glass and bricks.

There is a civil hospital. The town is connected with the general railway system and has regular steamer communication with other ports.

The harbour consists of a small shallow bay, protected by three moles and lined with quays. Molo Sant' Antonio extends about half a cable north-north-westward from the eastern entrance point and Molo Santa Lucia about the same distance east-south-eastward from the western entrance point, the passage between the moles being about half a cable wide. Braccio di San Nicola extends about 1½ cables north-eastward from the point on which the cathedral stands, a short distance north-westward of the western entrance point. The harbour is only capable of admitting vessels of shallow draught which moor under the shelter of Molo Sant' Antonio. Winds from the north-eastern quadrant cause much sea in the harbour.

In fine weather and with offshore winds, vessels can anchor about a mile off the town, in depths of from 7 to 9 fathoms (12^m8 to 16^m5).

Lights.—A light is exhibited, at an elevation of 31 feet (9^m4), from a circular tower, 16 feet (4^m9) in height, on the head of Molo Sant' Antonio.

A light is exhibited, at an elevation of 24 feet (7^m4), from the head of Braccio di San Nicola.

Charts 1440, 2158a, 2158b.

Chart 199.

Coast.—Between Trani and the town of Barletta, about $6\frac{1}{2}$ miles west-north-westward, the coast is low and sandy. Casino Ariscianno, a square white building in ruins, stands on the coast about $3\frac{1}{2}$ miles west-north-westward of Trani. The coastal bank, with depths of less than 5 fathoms (9^m1) over it, is as much as $1\frac{1}{4}$ miles wide in places off this stretch of coast.

Chart 199, plan of Barletta.

BARLETTA.—This town may be identified by the whitish belfry of the church of Santa Maria; the large bastioned castle, eastward of the town; the cathedral; and the light-tower on the western mole.

A straight, broad, white road runs from Barletta to Andria at right angles to the coast and is conspicuous from seaward. Barletta differs from other towns in this province in not having whitewashed houses.

In clear weather, vessels from northward may identify the position of Barletta by Castel del Monte, page 532, situated about 14 miles southward of the town, and from north-eastward, by Monte Vulture (chart 1440), 4,364 feet (1330^m1) high, situated about 37 miles south-westward of the town. See view facing this page.

Pilotage.—Pilotage is compulsory. A pilot boards vessels outside the harbour. A vessel should remain eastward of the entrance until boarded.

Harbour.—The harbour is north-eastward of the town and is formed by two moles. On its western side, a mole of irregular form, about $6\frac{1}{2}$ cables long, projects from the shore in a northerly and north-easterly direction; this mole is lined with quays and is connected to the railway system; Molo Centrale is in the centre and Molo Tramontana at the outer end of this mole. On the eastern side of the harbour, Diga di Levante, which is curved, projects about 7 cables in a northerly direction; the head of this mole is situated about $2\frac{1}{4}$ cables north-eastward of that of the western mole. This harbour is one of the safest on this part of the Adriatic shore and is not subject to surf.

A bank, with a depth of 3 fathoms (5^m5) over it, extends about three-quarters of a cable north-north-eastward from the head of Molo Tramontana (Lat. $41^\circ 20' N.$, Long. $16^\circ 18' E.$).

In 1944, the entrance to the harbour was reported to be silting; there were then depths of 20 feet (6^m1) in the entrance, and 4 fathoms (7^m3) or more in the northern part of the harbour. A bank, with depths of from $1\frac{1}{4}$ to $2\frac{1}{4}$ fathoms (2^m7 to 4^m6), occupied the southern part of the harbour; the northern limit of this bank was marked by a small mooring buoy.

Vessels drawing 19 feet (5^m8) could enter, in 1944, and lie alongside the seaward portion of Molo Tramontana; vessels drawing 17 feet (5^m2) could lie alongside that portion of the western mole which extends north-north-eastward from the main light-tower, or the first 300 feet (91^m4) of the quay extending north-north-westward from the Harbour master's office; vessels drawing 16 feet (4^m9) could lie either alongside the quay extending eastward from the Harbour master's office or alongside that portion of the quay which extends west-south-westward from the main light-tower.

Small vessels can berth alongside close southward of the main light-tower or alongside the northern portion of the quay extending north-north-westward from the Harbour master's office.

Charts 199, 1440, 2158a, 2158b.

To face page 534.

Castel del Monte.

*Barletta
church tower,
bearing 148° distant
about 18 miles.*

Torre dell' Ojano.

Margherita di Savoia.

Trinitapoli.

Monte Vulture.

Torre Rivolo.

View in 2 parts of Golfo di Manfredonia, south-western side.
(Original dated 1910.)

Chart 199, plan of Barletta.

Lights.—A light is exhibited, at an elevation of 70 feet (21^m3), from a circular brick tower, 64 feet (19^m5) in height, situated on the middle of the western mole (*Lat.* 41° 20' N., *Long.* 16° 17' E.). *See view.*

A light is exhibited on the south-eastern angle of the western mole close below this light-tower.

A light is exhibited, at an elevation of 29 feet (8^m8), from a circular masonry tower on a conical masonry structure, 24 feet (7^m3) in height, on the head of Molo Tramontana.

A light is exhibited, at an elevation of 23 feet (7^m0), from a masonry column, 18 feet (5^m5) in height, on the head of Diga di Levante.

A light is exhibited from the north-eastern corner of the quay near the Harbour master's office.

Anchorage.—There is anchorage offshore, either eastward or westward of Barletta. There are patches of rock in the anchorage eastward of the town, but westward of it there is sand and mud, and good holding ground. The two best berths are with the belfry of the church of Santa Maria, bearing 165°, one in a depth of 4½ fathoms (7^m8), at a distance of one mile off the western mole; the other, in a depth of 5½ fathoms (10^m1), at a distance of 2 miles off the western mole.

These anchorages are not recommended with the wind between north and east.

Town.—**Consular Officer.**—Barletta had a population of about 51,600 in 1939. A British Consular Officer resides in the town. There is a civil hospital.

Communication.—Barletta is connected to the general railway system. There is regular steamer communication with other ports in the Adriatic.

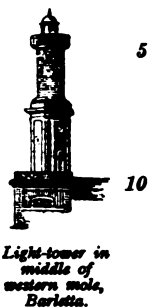
Trade.—**Port facilities.**—The principal exports are oil, wine, acids and cement; the imports are coal, wood, sulphur, copper sulphate, clay, pirites, phosphate and sulphate of ammonia.

Small repairs can be executed.

A limited supply of coal can usually be obtained.

Fresh provisions can be procured.

Water is laid on to the quays.



Light-tower in middle of western mole, Barletta.

Chart 199.

GOLFO DI MANFREDONIA.—This gulf is entered between Barletta (*Lat.* 41° 19' N., *Long.* 16° 17' E.) and Testa del Gargano, about 30 miles northward. The south-western and western sides of the gulf are low and sandy, with lakes and salt marshes within, and backed by an undulating and cultivated plain; the north-western side is high, steep, and backed by the lofty tableland of Promontorio del Gargano.

Coast.—There is a conspicuous cemetery on the coast, about a mile westward of Barletta. The mouth of Fiume Ofanto is situated about 3½ miles west-north-westward of Barletta. The deposit from this river, carried south-eastward by the current, causes the silting of the harbours in that direction. Fishing craft ascend the first reach of this river when the bar at its mouth is least obstructed, but it changes in position and extent in bad weather from the eastern semicircle.

Charts 1440, 2158a, 2158b.

T

Chart 199.

The coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about a cable wide here.

The remarkable white, square Torre dell' Ofanto stands, in the midst of trees, about three-quarters of a mile inland, a short distance southward of the river.

Margherita di Savoia, a small port with a mole, lies about 3 miles west-north-westward of the mouth of Fiume Ofanto; it consists of a line of light-coloured houses which appear to rise from the water. The town had a population of about 10,400, in 1939. Behind this port, there are salt marshes and an undulating, cultivated plain, at the south-eastern end of which can be seen the tops of the buildings of the town of Trinitapoli, with a remarkable white cupola, situated about 3 miles west-south-westward of Margherita di Savoia; the town of San Ferdinando di Puglia, 3½ miles farther south-south-westward, and more elevated, is conspicuous from seaward. See view facing page 534.

Light.—Anchorage.—A light is exhibited, at an elevation of 26 feet (7^m9), from a mast, 20 feet (6^m1) in height, on the molehead at Margherita di Savoia (*Lat.* 41° 23' N., *Long.* 16° 09' E.).

Vessels can anchor, in fine weather, about a mile off Margherita di Savoia, in a depth of 6 or 7 fathoms (11^m0 or 12^m8), mud, or farther out if desired.

Coast.—Between Margherita di Savoia and the town of Manfredonia, 18 miles north-north-westward, the coast is low, sandy, and intersected by lakes and marshes. Lago di Salpi lies from 4½ to 7½ miles north-westward of Margherita di Savoia, separated from the sea by a narrow strip of sand, near the centre of which stands Torre Pietre, easily identified by its remarkable construction. The lake communicates with the sea by two openings, one at each end. The mouth of Torrente Carapella lies 7 miles north-westward of Torre Pietre; its position is indicated by Torre Rivolo, which stands about three-quarters of a mile south-south-eastward of the entrance. See view facing page 534.

Lago Salso, about 10 miles north-north-westward of Lago di Salpi communicates with the sea by the mouth of Torrente Candelaro. The mouth of Canale di Sant' Antonio lies about a mile south-westward of Manfredonia.

Between Lago di Salpi and Manfredonia the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is as much as 2½ miles wide in places; a detached, rocky patch, with a depth of 5½ fathoms (10^m1) over it, lies about 3 miles south-eastward of the head of the eastern mole at Manfredonia.

Chart 199, with plan of Manfredonia.

Manfredonia.—Manfredonia, situated at the north-western corner of the gulf of that name, affords, in its roadstead, the best anchorage on the eastern coast of Italy, especially in heavy Bora gales. There is also a harbour for vessels drawing up to 18 feet (5^m5), formed by an eastern and a southern mole.

Lights.—Light-buoys.—A light is exhibited, at an elevation of 47 feet (14^m3), from a small tower on the head of the eastern mole.

A light is exhibited, at an elevation of 37 feet (11^m3), from a white concrete tower on the head of the southern mole.

A red conical light-buoy, exhibiting a *green fixed* light, is moored about a cable north-north-westward of the eastern molehead.

Charts 1440, 2158a, 2158b.

Chart 199, with plan of Manfredonia.

A black can light-buoy, exhibiting a *red fixed* light, is moored about half a cable eastward of the western molehead.

Anchorage.—Vessels ride safely in the roadstead off Manfredonia, about 2 miles offshore, in a depth of 6 or 7 fathoms (11^m0 or 12^m8), mud, with the town bearing about 318°, and the village of Monte Sant' Angelo, situated about 5 miles north-north-eastward of Manfredonia, bearing 003°, or farther out in greater depths if desired.

During summer, small vessels may anchor, in a depth of 5 fathoms (9^m1), mud, about half a mile south-eastward of the head of the eastern mole.

At the head of Golfo di Manfredonia, the Bora, called Monterese by the inhabitants, blows in violent squalls down the gorges of Promontorio del Gargano.

The roadstead off Manfredonia is exposed to winds from between south-south-east and north-east but, however violent in the offing, the wind seldom blows hard near the land, and the sea is never very heavy at the anchorage. A south-westerly wind sometimes blows in heavy squalls, but not for any length of time; it blows lightly almost every night, veers westward at daybreak, and remains in that quarter during the greater part of the forenoon.

Directions.—Promontorio del Gargano is lofty, with many isolated peaks, and is a useful guide to the anchorage off Manfredonia from whatever quarter it is approached. It is the first high land seen on the coast of Italy when coming from the Mediterranean; Monte Calvo, its highest peak, is 3,465 feet (1056^m1) high, and is situated about 9 miles north-westward of Manfredonia. Monte degli Angeli, 2,900 feet (883^m9) high, standing about 7 miles east-south-eastward of Monte Calvo, can be easily identified by the village of Monte Sant' Angelo, previously mentioned. A tower is situated at the western end of this village (*Lat. 41° 42' N., Long. 15° 58' E.*).

In running from north-westward for the anchorage off Manfredonia, during a Bora, Testa del Gargano should be rounded closely.

In summer, if the wind is north-westerly outside, it will generally be found east-north-easterly after passing Testa del Gargano; in winter, on the contrary, it hauls westward and blows in violent squalls from the high land.

Harbour.—The entrance to the harbour is about 1½ cables wide between the head of the eastern mole and that of the southern mole west-north-westward. There is a least depth of 19 feet (5^m8) in the entrance.

There is a good berth half way along the eastern mole; this berth is 350 feet (106^m7) long, with a least depth of 16 feet (4^m9) alongside. The wall is 4 feet (1^m2) high, with a clearance area 80 feet (24^m4) wide. There is a mooring buoy off this mole and several others in the harbour.

Along the southern mole, the harbour has been dredged to a depth of 19 feet (5^m8) to a distance of about one cable from the quay. In 1944, two wrecks fouled the inshore and broader portion of this quay, but vessels could still berth alongside the 1,200 feet (365^m8) of quay eastward of them. The wall here is 6½ feet (2^m0) high with a clearance area 25 feet (7^m6) wide. Care must be taken when berthing here, as debris from the wall has fallen into the water alongside in places. A spur near the root of the southern mole provides another berth for small

Chart 199, with plan of Manfredonia.

vessels; this spur has a depth of 15 feet (4^m6) alongside. There is a mooring buoy off this mole.

On the north-western side of the harbour, there is a quay, 1,000 feet (304^m8) long, with a least depth of 10 feet (3^m0) alongside, for small craft.

Town.—Manfredonia lies at the foot of Monte degli Angeli; it is walled and has a castle on the north-eastern side, with another smaller fort at the south-western corner. It contained about 18,800 inhabitants in 1939.

See view facing this page.

There is a small civil hospital.

The commerce of the town is chiefly in cereals, oil, wine, almonds, olive husks, wood and coal. It also exports bauxite.

Communication.—Manfredonia is connected to the general railway system. There is steamer communication with other Italian ports.

Chart 199.

Coast.—Lights.—Between Manfredonia and Testa del Gargano, about 17 miles north-eastward, the coast is high and mostly inaccessible. Monte Saraceno, 787 feet (239^m9) high and remarkably white, terminates in Punta Grugno, which slopes steeply to the sea, about 7½ miles north-eastward of Manfredonia. The village of Mattinata, which is conspicuous, is situated about a mile inland in cultivated land, between Punta Grugno and Punta Agnuli, 1½ miles north-north-eastward; Torre del Porto, about three-quarters of a mile northward of Punta Grugno, and a house near the light-column on Punta Agnuli are also conspicuous. *See view facing this page.*

Rocky shoals, with a depth of 13 feet (4^m0) over them, were reported, in 1946, to exist at a distance of 1½ cables off Punta Agnuli.

Torre Proposti, which is white, is situated close to the coast about 6½ miles north-eastward of Punta Agnuli.

A light is exhibited, at an elevation of 42 feet (12^m8), from an iron column on Punta Agnuli (Lat. 41° 43' N., Long. 16° 05' E.).

A light is exhibited, at an elevation of 197 feet (60^m0), from Torre Proposti, on the corner of a building, 72 feet (21^m9) in height.

The eastern part of Promontorio del Gargano presents a face about 11 miles broad. The coast is high and precipitous, and may be approached to a distance of not less



Torre Proposti lighthouse.

than one mile; Testa del Gargano is the most easterly projection of the promontory.

Close northward of Torre Proposti, there is a small, shallow bay with a sunken rock in the entrance. Torre di Campi stands on a small projection about 1½ miles farther northward; two islets of the same name lie close north-eastward of this tower. A sunken rock lies close off Testa del Gargano.

Charts 1440, 2158a, 2158b.

Monte Sani' Angelo.



Old telegraph tower.

Lighthouse (destroyed 1943),
bearing 325°, distant about half a mile.
Manfredonia.
(Original dated 1910.)

Monte Sacro.



Manfredonia.

Monte Saraceno. Punta Grugno,
bearing 291°, distant about 1½ miles.
Mattinata.
(Original dated 1910.)

Mattinata.

Tower.

Monte Sacro.



Manfredonia.

Monte Punta
Saraceno. Grugno.

Mattinata.



Testa del Gargano.

View in 2 parts of coast from Manfredonia to Vieste
(Original dated 1910.)

Vieste
Signal
station.

Vieste
Lighthouse,
bearing 331°
distant
1½ miles.



*Vieste lighthouse
on Scoglio Sta. Croce,
bearing 320° distant
one mile.*

Torre San Felice.

*San Francesco
convent.*

Vieste.

(Original dated 1910.)



*Testa del
Gargano.
Vieste La Ho,
bearing 186°, distant
8½ miles.*

Torre Porticello.

Vico del Gargano.



Monte d' Elio.

Rodi Garganico.

Ischitella.

Peschici.

Torre Calalunga.

Torre Gusmai.

View in 2 parts of northern coast of Promontorio del Gargano.

(Original dated 1910.)

Vico del Gargano.



Peschici.

*Tower on
Monte Pucci, bearing
166°, distant 5¼ miles.*

*Torre
San Menaio.*

Northern coast of Promontorio del Gargano, Peschici to San Menaio.

(Original dated 1910.)

Chart 199.

Anchorage.—The best anchorage for a vessel, not wishing to stand far into Golfo di Manfredonia, is off Mattinata, at a distance of 2 miles eastward of Punta Grugno, in a depth of 6 or $6\frac{1}{2}$ fathoms (11^m0 or 11^m9), mud. There is also anchorage within 3 miles of any part of the coast between Manfredonia and Mattinata, in similar depths, mud and good holding ground. 5

COAST.—Cala di San Felice, with a white tower of the same name on its southern side, lies close northward of Testa del Gargano. Torre Gattarella, elevated 220 feet (87^m1), stands on the coast about half a mile northward of Torre San Felice, and Torre di Portonuovo is situated a short distance farther north-westward. Between a rocky projection, about a mile north-north-westward of Torre Gattarella, and the town of Vieste, about 2 miles farther northward, there is a sandy beach. 15

Scoglio di Portonuovo, above water, lies about 4 cables northward of Torre Gattarella and 3 cables offshore; a reef extends about 3 cables south-eastward from this rock. Off the beach southward of Vieste, the coastal bank, with depths of less than 5 fathoms (9^m1) over it, is about a mile wide. See view facing page 538. 20

Anchorage.—Vessels may anchor temporarily off the beach southward of Vieste, in depths of from $5\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (10^m1 to 11^m9), hard mud. This anchorage, which is sheltered from westerly winds, may be used by vessels seeking shelter from that quarter, but the anchor should be weighed immediately the wind begins to abate. 25
Chart 199, plan of Vieste.

Vieste.—**Light.**—**Signal station.**—Between Punta San Francesco, on which there is a convent of the same name, situated about $3\frac{1}{2}$ miles northward of Testa del Gargano, and Punta San Felice, about 3 cables farther north-westward, there is a small, shallow bay. A sunken rock lies close off Punta San Francesco. Torre San Felice, which is circular, stands on the point of that name. Scoglio Santa Croce lies with its western extremity about a cable north-eastward of Punta San Felice; the south-western and south-eastern sides of this rock are bordered by a narrow, shallow bank. The small town of Vieste stands on the southern side of the bay and the suburb of Borgo, at its head. See view facing this page. 35

A light is exhibited, at an elevation of 132 feet (40^m2), from a white octagonal tower on a two-storied dwelling, 90 feet (27^m4) in height, on Scoglio Santa Croce. The name "Vieste" is painted, in black letters, on this lighthouse (Lat. $41^{\circ} 53' N.$, Long. $16^{\circ} 11' E.$). 40



Scoglio Sta. Croce lighthouse, Vieste. 45

Signals of distress, see page 44, are made at this lighthouse.

There is a signal station on the castle, situated at the south-western end of the town. Messages from vessels will be transmitted by telegraph.

Overhead cable.—An overhead cable, with 65 feet (19^m8) headway, 50 crosses the channel between Scoglio Santa Croce and the mainland south-westward. Vessels having masts higher than 59 feet (18^m0) are prohibited from using the channel.

Charts 199, 1440, 2158a, 2158b.

Chart 199, plan of Vieste.

Anchorage.—**Mole.**—Vessels may anchor, with offshore winds, both north-westward and south-eastward of Vieste.

A good berth is in a depth of 6 fathoms (11^m0), with Torre San Felice in line with the southern end of Scoglio Santa Croce, bearing 270°, and the belfry of San Francesco convent in line with the south-eastern extremity of the town, bearing about 230°. Large vessels should anchor farther out. Small vessels can anchor according to the wind, either southward of San Francesco convent or westward of Torre San Felice; the latter anchorage is the most frequented.

A mole extends about 230 feet (70^m1) offshore westward of Torre San Felice; this mole forms the northern side of Cala San Lorenzo and is available for discharging cargo.

Town.—Vieste, which contained about 10,200 inhabitants, in 1939, stands at the foot of Monte Gennaro, 1,322 feet (403^m0) high, about 4 miles south-westward. The town may be identified by its castle and signal station, and by a belfry overlooking the town. A limited quantity of provisions can be obtained. Coasting steamers call.

Chart 199.

Coast.—From Vieste, the coast trends about 9 miles north-westward to the village of Peschici, and, although there are sandy beaches, it is generally difficult of access, even to fishing boats. The most conspicuous objects are Torre di Porticello, situated, at an elevation of 43 feet (13^m1), about 2½ miles north-westward of Vieste; Torre di Spinale, about 2½ miles farther north-westward and Torre di Calalunga, about 1½ miles north-westward of Torre di Spinale. The coast may be approached to the distance of a mile, bearing in mind that the current sets towards it. See views facing page 539.

Peschici, which contained about 3,600 inhabitants, in 1939, is situated on an arid, precipitous promontory; between this promontory and another, on which stands Torre di Monte Pucci, about three-quarters of a mile westward, there is a small bay. On the mountains south-westward, the town of Vico del Gargano may be seen. There is indifferent anchorage for small vessels, with local knowledge, in the bay westward of Peschici, in a depth of 2½ or 3 fathoms (5^m0 or 5^m5), mud, but there are rocks, two above-water and one with a depth of 3 feet (0^m9) over it, lying in the eastern part of the bay.

The village of San Menaio, containing about 500 inhabitants, in 1939, is situated close to the coast midway between Peschici and the town of Rodi Garganico (*Lat.* 41° 56' N., *Long.* 15° 53' E.), about 6 miles westward. Torre di San Menaio, which is white and square, stands near the middle of the village, and is conspicuous. See view facing page 539.

Depths of less than 5 fathoms (9^m1) extend as much as 1½ miles offshore between Peschici and Rodi Garganico. Vessels of deep draught may anchor between these two towns at a distance of 1½ miles or more offshore, in depths of about 10 fathoms (18^m3), sheltered from south-easterly gales and all offshore winds.

Rodi Garganico, which contained about 4,700 inhabitants, in 1939, is situated on a precipitous hill which projects a short distance from the coast; it lies among gardens and olive groves and may be identified by the church steeple of the town of Ischitella, which is situated, at an elevation of 1,017 feet (310^m0), about 1½ miles southward. There is a long wall with arches in it and a large central building situated

Charts 1440, 2158a, 2158b.

To face page 541.

Ischiaella.



*Rodi Garganico,
bearing 204°, distant
6½ miles.*



Torre Varano.

Monte Sfrizzo.

Monte d'Elio.

Torre Miledo.

View in 2 parts of northern coast of Promontorio del Gargano from Rodi Garganico to Torre Miledo.
(Original dated 1910.)

Monte d'Elio.

Monte Sfrizzo.



Torre di Calarossa.

*Torre Miledo,
bearing 151°, distant
about 1½ miles.*

Monte d'Elio.

(Original dated 1910.)

Chart 199.

westward of the town; and a church with a yellow cupola towards the western edge of the houses. *See* view facing this page.

A mole extends three-quarters of a cable eastward, affording some shelter for small craft from northerly winds.

A trade in herbs, dried fruits and timber is carried on.

Vessels can anchor, in a depth of about $3\frac{1}{2}$ fathoms (6^m9), about half a mile west-north-westward of the town; they should be prepared to leave at the first signs of northerly winds. Small craft, wishing to communicate with the town, may anchor about $1\frac{1}{2}$ cables offshore eastward of the harbour, in a depth of $2\frac{1}{2}$ fathoms (4^m1).

The anchorage is safe only with winds between south and west.

Light.—A light is exhibited, at an elevation of 33 feet (10^m1), from an iron column on a circular hut, 28 feet (8^m5) in height, on the mole-head at Rodi Garganico.

The description of this coast is continued on page 544.

Chart 199, plans of Tremiti islands and Tremiti islands anchorage.

OFF-LYING ISLANDS.—**Isole Tremiti.**—Isole Tremiti, four in number, are situated about 20 miles north-westward of Rodi Garganico and 12 miles offshore. The population, in 1939, was about 1,000. Fishing is carried on round the islands, sometimes with flares.

The islands are low by comparison with the mainland, the highest point being a hill at the southern end of Isola San Domino, 377 feet (114^m9) high. Their coasts, especially on the northern side, are generally steep and inaccessible. *See* view on chart 199, and view facing page 542.

Isola San Domino, the largest and south-westernmost of the group, is also the most fertile and best cultivated, its southern slopes being covered with trees and the upper level parts with vineyards. On its western side, Bue Marino grotto, which can be entered in a boat, is situated about a cable northward of the lighthouse (*Lat.* $42^\circ 06' N.$, *Long.* $15^\circ 29' E.$) at the south-western end of the island; Cala della Vasca, or Inglesi cove, is situated between two projecting points about three-quarters of a mile north-north-eastward of the lighthouse.

Toppa del Caino, the eastern extremity of Isola San Domino, is yellowish and conical; near it there is a red tower, and northward of it there is a landing place.

Isola San Nicola lies with its south-western extremity about $1\frac{1}{2}$ cables eastward of Toppa del Caino, to which it is connected by a bank, with depths of less than 3 fathoms (5^m5) over it. Isola San Nicola is steep and rocky and contains the whole population of the group; at its south-western end, there is a conspicuous fortified enclosure or citadel within which there are dwellings, a church with a belfry, and the signal station. There is a small pier for boats and a landing place at the south-western end of the island. On the south-eastern side of the citadel, there is a zigzag road cut in the rock which leads down to a small landing place below the signal station.

Il Cretaccio, the smallest of the group, is yellowish, and lies about three-quarters of a cable off the north-eastern end of Isola San Domino, on the northern side of the bank connecting the latter island with Isola San Nicola. Scoglio La Vecchia, which is blackish, lies close off the eastern extremity of Il Cretaccio.

There is a passage between Isola San Domino and Il Cretaccio, in

Charts 199, 1440, 2158a, 2158b.

Chart 199, plans of Tremiti islands and Tremiti islands anchorage. the fairway of which there is a depth of $1\frac{1}{2}$ fathoms (3^m2), but there is no passage between the latter and Scoglio La Vecchia. The passage between Isola San Nicola and Scoglio La Vecchia is only suitable for 5 small vessels, with local knowledge.

Isola Caprara, the north-easternmost of this group, is steep on its northern side, gradually slopes southward, and is separated from Isola San Nicola by a passage about $1\frac{1}{2}$ cables wide; a vessel using this passage should keep in mid-channel.

10 Local steamers call regularly.

See view facing this page.

Dangers.—Buoy.—A rocky shoal, with a depth of 3 fathoms (5^m5) over it, lies about a cable west-south-westward of the northern entrance point of Cala della Vasca.

15 Secca del Cretaccio, with a depth of 5 feet (1^m5) over it, rock, lies at the north-eastern end of a bank, with depths of less than 5 fathoms (9^m1) over it, which extends about $1\frac{1}{4}$ cables from the north-eastern end of Il Cretaccio. This shoal is marked, on its northern side, by a conical buoy, painted in black and white bands and surmounted 20 by a ball.

The south-western extremity of Isola San Nicola, bearing 195° , and open eastward of Scoglio La Vecchia, leads about half a cable eastward of Secca del Cretaccio.

A rocky shoal, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it, lies about 25 three-quarters of a cable off the south-western extremity of Isola Caprara.

30 **Lights.—Signal station.**—A light is exhibited, at an elevation of 159 feet (48^m5), from a white octagonal tower, on a white house, 52 feet (15^m8) in height, near Punta del Diavolo, the south-western extremity of Isola San Domino. See view:

35 A light is exhibited, at an elevation of 113 feet (34^m4), from a white octagonal tower on a dwelling, 65 feet (19^m8) in height, on the northern coast of Isola Caprara, about 2 cables westward of Punta Secca, the eastern extremity of the island (*Lat. $42^\circ 08' N.$, Long. $15^\circ 31' E.$*).

40 Distress signals are made from this lighthouse, see page 44.

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a circular base on the pierhead at the south-western end of Isola San 45 Nicola.

There is a signal station, consisting of a house painted in black and white chequers, situated, at an elevation of 266 feet (81^m1), on the north-eastern corner of the citadel on Isola San Nicola. See 50 page 46.

Telegraph cable.—Beacons.—A submarine cable, indicated on the chart, is landed immediately below the signal station on Isola San Nicola. The direction of the cable is indicated by two beacons. Vessels should avoid anchoring in the vicinity of this cable.



Punta del Diavolo lighthouse.



Isola Caprara lighthouse.

Charts 199, 1440, 2158a, 2158b.

Signal station.



Isole San Nicola.

Isole Caprazza



Soglio La Vecchia. La Ho,
bearing 087°, distant
1½ miles.

Il Credaccio.



Isole San Domino,
north-eastern end.



Isole Tremiti.
(Original dated 1910.)

To face page 543.



*Beacon.
Light-structure.*

Isola Pianosa, from north-westward, distant 6 cables.

(Original dated 1939.)

Lighthouse.

*San Michele
chapel.*

*Sasso di
Tramontana.*



*Sogli
Mani.*

Isola Pelagosa Grande, bearing 000°, distant 2 miles.

Isola Pelagosa.

(Original dated prior to 1919.)

Isola Pelagosa Piccolo. Sasso d'Ostro.

Chart 199, plans of Tremiti islands and Tremiti islands anchorage.

Anchorage.—**Mooring buoys.**—The anchorage at Isole Tremiti gives sufficient shelter from a Bora gale.

A vessel of deep draught should anchor off the south-eastern coast of Isola San Domino, about 3 cables offshore, in depths of from 17 to 35 fathoms (31^m1 to 64^m0), mud, and good holding ground. The nearer a vessel approaches the south-western end of Isola San Nicola, the better the shelter from a Bora.

There is a mooring buoy about a cable westward of the south-western extremity of Isola San Nicola, and another about 1½ cables 10 northward of the same point and eastward of Il Cretaccio.

With east-north-easterly gales, there is shelter westward of the southern end of Isola Caprara, at a short distance offshore.

Cala Sorrentina and Cala dei Turchi, situated on the north-western side of Isola Caprara, about one and 3 cables, respectively, from its 15 southern extremity, both afford shelter to small vessels, with local knowledge, with winds between east and south.

When approaching these anchorages, it must be borne in mind that the currents are strong, particularly in the channels.

Anchorage is prohibited in the vicinity of the landing place at the 20 foot of the citadel.

Chart 199, plan of Pianosa island.

Isola Pianosa.—**Beacon.**—Isola Pianosa, 50 feet (15^m2) high, is situated about 11½ miles east-north-eastward of Isola Caprara. It is a low, flat, arid rock, rising a little on its northern side, which is 25 steep-to; its south-western, southern, and south-eastern sides are bordered by a bank, with depths of less than 6 fathoms (11^m0) over it, about three-quarters of a cable wide. The currents in its vicinity are, at times, strong and uncertain in direction. See view facing this page. 30

A beacon consisting of an iron framework truncated pyramid, with a small gallery, standing on a conical masonry base, is situated eastward of the light-structure.

Light.—A light is exhibited, at an elevation of 67 feet (20^m4), from a framework structure on a hut, 41 feet (12^m5) in height, situated on the northern coast of Isola Pianosa (*Lat.* 42° 13' N., *Long.* 15° 45' E.).

Chart 199, plan of Pelagosa islands.

Isole Pelagosa.—Isole Pelagosa Grande and Piccolo lie nearly in the middle of the Adriatic, about 25 miles east-north-eastward of Isola 40 Pianosa and about midway between Testa del Gargano and Isola Lagosta, page 210.

Isola Pelagosa Grande is an uncultivated rocky island rising precipitously at its southern side but less steeply at its northern side; its summit, 285 feet (86^m9) high, is towards its western end. 45 Scogli Manzi, one of which is 8 feet (2^m4) high and others are awash, with Scoglio Pampano close westward of them, lie from half a cable to 1½ cables off the western extremity of the island. At the north-western end of the island, there is a cove where fishermen can haul up their boats in bad weather. See view facing this 50 page.

A bank, with a depth of one fathom (1^m8) over its outer end, extends about three-quarters of a cable from the south-eastern end of Isola Pelagosa Grande.

Charts 199, 1440, 2158a, 2158b.

T*

Chart 199, plan of Pelagosa islands.

Isola Pelagosa Piccola, 127 feet (38^m7) high, lies with its western extremity about a cable east-south-eastward of the larger island. Several islets and above-water rocks lie at short distances off Isola

5 Pelagosa Piccola, the positions of which can best be seen on the chart. The passage between Isola Pelagosa Grande and Isola Pelagosa Piccola, in which there is a shoal with a depth of 7 feet (2^m1) over it, should not be used without local knowledge.

A vessel should avoid approaching these islands closely, especially 10 at night or in thick weather, on account of the currents, *see* pages from 34 to 39. At night or in thick weather a vessel is recommended to pass westward of these islands.

Lights.—A light is exhibited, at an elevation of 360 feet (109^m7), from an octagonal stone tower on a dwelling, 74 feet (22^m6) in height, 15 on the summit of Isola Pelagosa Grande.

Distress signals are made from this lighthouse, *see* page 44.

A light is exhibited, at an elevation of 308 feet (93^m9), from a grey quadrangular pyramidal iron framework structure, 13 feet (4^m0) in height, situated close eastward of the lighthouse, just described (*Lat.* 20 42° 23' N., *Long.* 16° 15' E.).

Chart 199.

Isolotto Caiolo.—Dangers.—Isolotto Caiolo, 19 feet (5^m8) high, is situated about 3 miles east-south-eastward of Isola Pelagosa Piccola. A reef extends a short distance westward, northward and north-east- 25 ward of this islet; there is a 4-fathom (7^m3) patch about 1½ cables west-north-westward, a 4-fathom (7^m3) rocky patch about 2 cables south-eastward, and a rock with a depth of 3 feet (0^m9) over it about 2 cables east-north-eastward, of the islet.

Scogliera Pampano, with a depth of less than 6 feet (1^m8) over it, 30 which breaks, lies from 4 to 5 cables eastward of Isolotto Caiolo.

Isolotto Caiolo and Scogliera Pampano are covered by the *red* sector of the light on Isola Pelagosa Grande, between the bearings of 264° and 304°.

Charts 199, 200.

35 **COAST.—General remarks.**—Westward of Rodi Garganico, a long sandy beach begins, which extends almost as far as Monte Conero, near Ancona. From Rodi Garganico to the mouth of Fiume Tronto, a distance of about 106 miles, the coast is not very populous and is mostly only cultivated in the vicinity of the towns; but, with the 40 exception of the harbour at Ortona a Mare, there is not a single harbour wherein a vessel may obtain shelter. The coast is fringed by a shallow bank of sand and gravel, from 3 to 4 cables wide; farther off, the bottom is mud, or mud and sand.

In the fine weather, a vessel may proceed along this portion of the 45 coast at a distance of a little over a mile, in depths of from 6 to 10 fathoms (11^m0 to 18^m3). With offshore winds, or, in fine weather, even with south-easterly winds, vessels may anchor at a distance of 2 miles offshore, in good holding ground.

Chart 199.

50 Punta Capoiale, the termination of a long sandy shore, lies about 10 miles westward of Rodi Garganico; Torre Mileto, which is square and white, stands on a point of the same name, about 2 miles farther westward. The coast between these two points, and for a mile farther

Charts 1440, 2158a, 2158b.

Chart 199.

westward, is rocky, rather high, and precipitous. Monte d'Elio, 827 feet (252^m1) high, about 1½ miles south-south-eastward of Punta Mileto, is dark in colour, due to olive plantations, with an elongated yellow spot in the centre; Torre di Calarossa, square and dark, stands about midway between the two points. Punta Mileto (*Lat.* 41° 55' N., *Long.* 15° 37' E.) is remarkable for its projection northward between two long sandy beaches, and is the termination of a chain of heights separating Lago Varano, on its eastern side, and Lago Lesina, on its western side. 5 10

On each side of Punta Mileto there is a cove; anchorage is prohibited in the eastern one, but in the western, a small vessel, with local knowledge, can anchor, in a depth of about 2½ fathoms (4^m1), at a distance of 1½ cables offshore.

See views facing page 541. 15

Lago Varano and Lago Lesina, are each separated from the sea by a low narrow strip of sand overgrown by bushes, and each communicates with the sea by a narrow channel. These channels are inaccessible to boats.

Telegraph cable.—Beacon.—A submarine cable is landed at Punta Mileto. A beacon with a notice board marks the position, whence it runs about 1½ cables northward and then north-north-westward. 20

Coast.—The dark grey Torre Scampamorte, with a white hut above, is situated about 6½ miles westward of Punta Mileto. 25

The Adriatic coast railway, which quits the neighbourhood of the coast westward of Barletta and passes westward of all the high land of Promontorio del Gargano, again approaches the coast near the western end of Lago Lesina, crossing Fiume Fortore about 1½ miles inland, and thence keeps close to the coast the whole way to Rimini. 30

Punta Pietre Nere lies about 6 miles westward of Torre Scampamorte. Torre del Fortore, rectangular, light-coloured and conspicuous, with a building and a chimney near it, stands about half a mile south-westward of Punta Pietre Nere, and the village of Poggio Imperiale, elevated 240 feet (73^m1), with a white belfry, is situated about 5½ miles farther south-south-eastward. 35

From north-westward, Monte Spigno, 3,347 feet (1020^m2) high, one of the peaks of Promontorio del Gargano, about 13½ miles west-south-westward of Testa del Gargano, appears as the left-hand peak of a long and flat mountain ridge. 40

The mouth of Fiume Fortore is situated about 2½ miles westward of Punta Pietre Nere (*Lat.* 41° 55' N., *Long.* 15° 21' E.). Small craft, drawing about 3 feet (0^m9), can ascend the river when the changing position of the shallow banks at its mouth allow.

Vessels can anchor, at a distance of 1½ miles offshore, northward of the mouth of Fiume Fortore, in a depth of 9 or 10 fathoms (16^m5 or 18^m3), sand. This, however, is a bad anchorage with north-easterly and northerly winds, as they raise a heavy sea and accelerate the currents; but it affords tolerable anchorage with easterly and south-easterly winds, an advantage not possessed by any of the anchorages westward as far as Ancona. 50

Between the mouth of Fiume Fortore and the mouth of Fiume Biferno, about 12 miles west-north-westward, the coast is low and almost entirely covered with woods; the shore is a sandy beach, the

Charts 1440, 2158a, 2158b.

Chart 199.

only remarkable objects near the coast being Torre Fantina, a whitish quadrangular truncated pyramid, situated about 6 miles westward of the mouth of Fiume Fortore and near Chieuti station, and then the village of Campomarino, about 6 miles farther west-north-westward. Campomarino, which had about 1,600 inhabitants, in 1939, stands on a wooded plateau at an elevation of 738 feet (224^m9), on the eastern bank of Fiume Biferno; the village has a conspicuous belfry and a reddish railway station.

10 Fiume Biferno flows into the sea through marshes and low sandy land; fishing boats can ascend the river when the waters are swollen.

The villages of Chieuti, on a hill 728 feet (221^m9) high, about 8 miles south-westward of Torre del Fortore; Serracapriola, on a hill 886 feet (270^m0) high, 2½ miles southward of Chieuti; and San Martino in Pensilis, 925 feet (281^m9) high, about 7 miles west-north-westward of Chieuti, are easily identified by their belfries.

See view facing page 547.

Termoli.—The old portion of this town stands on a small rocky peninsula, about 3½ miles north-westward of Campomarino; it is connected to the railway system and contained about 6,600 inhabitants, in 1939. In the south-western part of the peninsula, there is a conspicuous square, brown tower. The church in the town has a low belfry; there is also a conspicuous cemetery about three-quarters of a mile westward of the town. The new portion of the town is situated on a small hill close southward of the old.

Harbour.—Light.—There is a small harbour, formed by two moles, on the south-eastern side of the peninsula on which Termoli stands. The northern mole extends eastward for about a cable and then south-eastward for the same distance; the latter portion was damaged, in 1943, and vessels could not then lie alongside. There are depths of from 3 to 4 feet (0^m9 to 1^m2) alongside the quay and small craft can anchor in the harbour with their sterns secured to this mole.

The southern mole, 330 feet (100^m6) long and slightly curved, extends eastward from a point about 1½ cables southward of the root of the northern mole. There is a depth of 8 feet (2^m4) along the northern side of this mole, but it is too much exposed for berthing.

There are depths of 2 fathoms (3^m7) in the centre of the harbour, with depths of 11 feet (3^m4) in the entrance.

This harbour is very open, especially to south-easterly gales.

40 A light is exhibited, at an elevation of 21 feet (6^m4), from an iron column, 16 feet (4^m9) in height, on the head of the northern mole (*Lat.* 42° 00' N., *Long.* 15° 00' E.).

Target.—A target, indicated on the chart, is moored about 2½ miles east-south-eastward of Termoli and one mile offshore.

45 **Anchorage.**—Vessels can anchor off Termoli, at a distance of 1½ or 2 miles northward or north-eastward of the town, in depths of from 10 to 11 fathoms (18^m3 to 20^m1). This anchorage is, however, very inconvenient with easterly and northerly winds. Small vessels, with local knowledge, can anchor in the small bay westward of the town, where they are sheltered from south-easterly and offshore winds, but from no others.

Coast.—From Termoli, the coast trends 14 miles west-north-westward, and then 4 miles northward to Punta Penna, and is low, wooded and bordered by a sandy beach. The only town is that of Istonio,

Charts 1440, 2158a, 2158b.

To face page 547.

Chiotti. Serracapriola.

Rignano.

Torre Fantina.
San Martino.

Campomarino,
bearing 192°, distant about 6½ miles.

View in 2 parts of coast near Campomarino.
(Original dated 1910.)

Guglionesi.

Termoli,
bearing 220°, distant
4½ miles.

Pelacciato wood.

Monte Maicella.

View in 2 parts of coast from Termoli to Punta Penna.
(Original dated 1910.)

Punta Penna.
Sta. Maria church
and tower; lighthouse
not shown.

Chart 199.

situated in the angle of the coast, 14 miles west-north-westward of Termoli. The interior of the country is mountainous.

The village of Petacciato, elevated 738 feet (224^m9), on a hill covered with trees, forming part of the wood of the same name, is conspicuous from seaward, and lies about a mile south-westward of a square, squat, whitish tower, situated on the edge of the land which here slopes to the beach, 5½ miles westward of Termoli.

See view facing this page.

Numerous rivers and torrents flow into the sea between Termoli and Istonio; the mouth of Torrente Sinarca, about 1½ miles westward of Termoli, can be identified by a masonry bridge with four arches; 1½ miles westward of the bridge, there is a square tower.

Fiume Trigno, the position of which is shown by Torre Montebello on its eastern bank, is navigable for small craft when the banks at its mouth admit of their crossing the bar. Torre Montebello, square and dark, stands on a hill, 190 feet (57^m9) high, about half a mile from the mouth of the river. A long bridge with arches crosses Fiume Trigno near this tower.

The town of San Salvo stands on a hill, 328 feet (100^m0) high and covered with trees, about 3 miles west-south-westward of Torre Montebello.

Istonio is situated, at an elevation of 472 feet (143^m9), about half a mile inland. The town had a population of about 11,000, in 1939, and is connected to the railway system. Conspicuous objects are a square tower southward of the town and three belfries, of which the central and tallest is quadrangular, with a conical cupola.

Istonio Marina consists of a group of houses. A two-storied villa with battlements is conspicuous in the middle of the marina among a group of trees; there are three chimneys at the southern end of the marina and one at the northern end.

The neighbourhood is cultivated.

The coast between Istonio and Punta Penna is rocky, high, partially covered with olive trees and vineyards, and inaccessible on account of the rocks by which it is closely bordered.

Punta Penna (*Lat. 42° 10' N., Long. 14° 43' E.*) is composed of dark rocks, and is easily identified by a tower on its summit, by Santuario di Santa Maria, a small building with a squat hexagonal superstructure, a short distance southward of the tower, and by a large building a short distance inland.

Light.—A light is exhibited on Punta Penna.

Anchorage.—There is anchorage about 1½ miles northward of the whitish tower near Petacciato, in a depth of about 8 fathoms (14^m6), sand and good holding ground. This anchorage is preferable to that off Termoli, because, with offshore winds, there is less sea.

Vessels can anchor about 3 miles north-eastward of Istonio Marina, in depths of 7 or 8 fathoms (12^m8 or 14^m6). Small vessels, with local knowledge, anchor nearer the town, at a distance of about one mile offshore. The best holding ground is reported to be northward of Istonio Marina, towards Punta Penna. These anchorages are dangerous with winds between north-east and east-south-east.

Small craft, with local knowledge, can find shelter from southerly and south-easterly winds in a small cove close westward of Punta Penna, in a depth of 2½ fathoms (5^m0).

Charts 1440, 2158a, 2158b.

Chart 199.

Coast.—Danger.—From Punta Penna to the mouth of Fiume Sangro, about $8\frac{1}{2}$ miles north-westward, the shore is sandy and is everywhere accessible except for a stretch from three-quarters of a mile to $1\frac{1}{2}$ miles westward of Punta Penna, where there are some above-water rocks lying close offshore. Amongst the numerous streams on this coast, Fiume Sangro is navigable for small craft when the entrance is open, and the railway crosses the river near its mouth on a pile bridge, and also 2 miles higher up on a long bridge with several arches. The town of Paglieta, elevated 771 feet (235^m0), on a hill in the valley of the river, about $4\frac{1}{2}$ miles inland, is visible from the sea. See view facing this page.

Charts 199, 200.

Between the mouth of Fiume Sangro and that of Torrente Feltrino, about 6 miles north-westward, the coast is bordered in places by above-water rocks; between Punta Rocca San Giovanni and Punta Malvo, situated $2\frac{3}{4}$ and 4 miles, respectively, north-westward of the mouth of Fiume Sangro, above-water and sunken rocks extend as much as $3\frac{1}{2}$ cables offshore.

A shoal, with a depth of $4\frac{1}{2}$ fathoms (8^m7) over it, lies about 2 miles northward of Punta Rocca San Giovanni and $1\frac{1}{2}$ miles offshore.

The village of San Vito Chietino, which contained about 2,000 inhabitants, in 1939, is situated on the eastern bank of Torrente Feltrino and a short distance inland; it stands on the edge of a hill which slopes steeply to the beach. At the south-eastern end of the beach abreast the village, there is a chimney and at the north-western end, a small fort.

A mole for fishing vessels extends about $1\frac{1}{2}$ cables offshore near the mouth of Torrente Feltrino; in 1939, there was a depth of 6 feet (1^m8) at the head of this mole, but the bottom hereabouts is subject to silt.

Between the mouth of Torrente Feltrino and the town of Ortona a Mare, about $3\frac{1}{2}$ miles north-westward, the coast is low and accessible. Punta del Moro, which is rocky, and lies about $1\frac{1}{2}$ miles south-eastward of Ortona a Mare, is pierced by a railway tunnel.

See view facing this page.

Chart 200, with plan of Porto di Ortona.

ORTONA A MARE.—The position of Ortona a Mare (Ortona) may easily be identified from seaward by Monte Maiella (Majella), a rounded mass, 9,170 feet (2795^m0) high, standing about 22 miles south-westward (chart 1440), and, on nearing the coast, by the church steeple of the village of Chieti, about 10 miles westward, of the town. The cathedral, surmounted by a cupola (*Lat.* 42° 21' N., *Long.* 14° 24' E.), situated in the middle of the town, and the old castle, almost demolished, in 1944, at the north-eastern end of the town, are conspicuous. The square belfry of Santa Maria di Costantinopoli, which stands isolated, on a spur, about 6 cables southward of the castle, is conspicuous from northward; as are two chimneys in a valley about 3 cables south-south-eastward of this church.

Light.—A light is exhibited, at an elevation of 180 feet (54^m9), on a cliff close eastward of the castle.

Chart 200, plan of Porto di Ortona.

Anchorage.—A vessel can anchor about a mile eastward of Ortona

Charts 199, 1440, 2158a, 2158b.

Monte Odorisio.



Punta Penna, bearing 182°, distant 11 miles.
Lighthouses not shown.

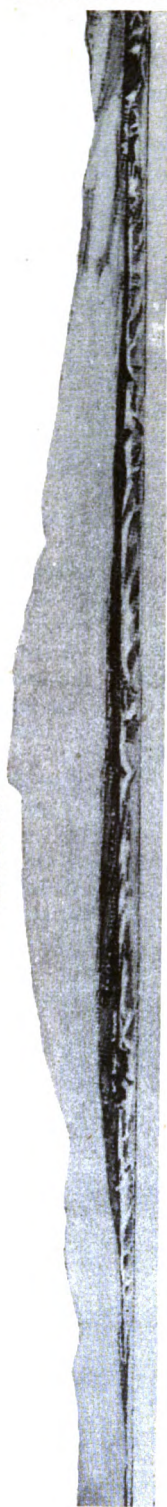
Mouth of
Fiume Astinello.



Pagiteda. Mouth of
Fiume Sangro.

View in 2 parts of coast from Punta Penna to Fiume Sangro.
(Original dated 1910.)

Monte Maella.



Lanciano.

San Vito.



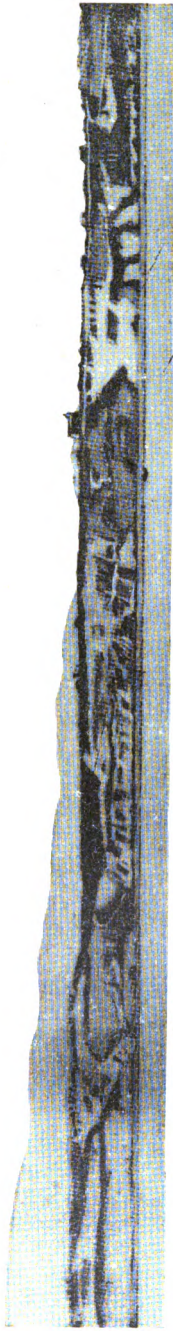
Chieti. Ortona a Mare,
bearing 273°, distant
10½ miles.

Francavilla al Mare.

View in 2 parts of coast from Fiume Sangro to Francavilla al Mare.
(Original dated 1910.)

To face page 549.

Monte Maiella.



Cathedral,
bearing 265° distant
1½ miles.

Monte Corno or
Gran Sasso d'Italia.



Railway
station.

Harbour. Lt. Ho.

Castle.

Torre Mucchia.

View in 2 parts of Ortona a Mare.
(Original dated 1910.)



Ortona a Mare.



Francavilla
al Mare.

Monte Matella.

Chieti. San Silvestro.

View in 2 parts of coast from Ortona a Mare to Pescara.
(Original dated 1910.)

Pescara,
bearing 232°
distant 6 miles.

Chart 200, plan of Porto di Ortona.

a Mare, in a depth of 6 fathoms (11^m0), good holding ground. This anchorage is dangerous with easterly winds.

Harbour.—Beacon.—The harbour is protected from northward by the promontory on which the town stands, and by Molo Costanzo Ciano (Vecchio), which extends about three-quarters of a mile in an east-south-easterly direction from the north-eastern end of the town; from the southern side of this mole, about 3 cables eastward of its root, Molo a Martello extends about 90 yards (82^m3) south-south-westward. From southward, the harbour is sheltered by Molo Sud extending about 3 cables east-north-eastward from close northward of the mouth of the Torrente Saraceni, situated about a mile southward of the root of the northern mole; the outer end of this mole, which has two heads, is below water for a distance of about 44 yards (40^m2). There are a number of breaches in both moles.

A beacon stands a short distance within the northern molehead.

There are some jetties in the north-western part of the harbour, and a mooring buoy about 2½ cables south-westward of the head of Molo Costanzo Ciano.

The harbour is almost completely occupied by a bank, with depths of less than 3 fathoms (5^m5) over it, the extent of which can best be seen on the chart. The harbour is subject to silt, especially in its north-western part. Eastward and south-eastward of Molo a Martello, the south-western side of Molo Costanzo Ciano is bordered by a shallow, rocky bank, three-quarters of a cable wide in places.

There is anchorage for small vessels near the entrance to the harbour, in depths of from 13 to 16 feet (4^m0 to 4^m9), affording moderate shelter in northerly and north-easterly winds. The holding ground is bad.

Strong easterly winds cause much sea in the harbour and are dangerous; with south-easterly winds, the sea, coming along the coast, is not so heavy.

Caution.—The heads of both the northern and southern moles should be given a berth of not less than three-quarters of a cable.

Town.—Ortona a Mare is connected to the railway system. It contained about 9,200 inhabitants, in 1939. The environs are cultivated.

The imports are chiefly wood and coal, and the exports, bricks, herbs, manure and cereals.

A limited quantity of fresh provisions can be obtained and water is laid on to Molo a Martello; there is usually a small quantity of coal in stock.

See view facing this page.

Weather.—It is reported to be prognostic of the Scirocco when the crest of Monte Maiella (Lat. 42° 05' N., Long. 14° 05' E.) remains uncovered while all the remaining mountains are enveloped in clouds; frequent lightning on the summit of Monte Maiella and Monte Corno, 33 miles north-westward, is reported to indicate probable easterly winds, accompanied by rain.

Currents.—The current generally is south-east-going, especially in winter, and with winds from the northern semicircle may attain a rate of as much as 3 knots. In summer, there are sometimes winds from the south-eastern quadrant which cause perceptible currents.

Charts 1440, 2158a, 2158b.

Chart 200.

COAST.—Between Ortona a Mare and the mouth of Fiume Pescara, 10½ miles north-westward, the coast is low, sandy and backed by hills. Monte Corno or Gran Sasso d'Italia, the summit of which is 9,583 feet (2920^m9) high, stands 29 miles westward of the mouth of Fiume Pescara. This is the highest mountain in the neighbourhood and may be distinguished by its twin pyramidal peaks; the range on which it is situated extends about 14 miles east-south-eastward of it. See view facing page 549.

- 10 Torre Mucchia, which is square and embattled, is situated, at an elevation of 194 feet (59^m1), about 2 miles north-westward of Ortona a Mare; a mile farther in the same direction is a reddish masonry bridge with five arches at the mouth of Fiume Arielli.

About 4½ miles north-westward of Ortona a Mare lies the wide valley of Fiume Foro, in the middle of which, 3 miles inland, the town of Miglianico is situated on a verdant hill, 492 feet (150^m0) high, with a church having a small square belfry. About 6 miles north-westward of Ortona a Mare is the town of Francavilla al Mare, which had about 4,100 inhabitants in 1939; the town is near the coast on a small hill 20 surrounded by cultivation. Anchorage off Francavilla al Mare is not recommended even in moderate weather.

Fiume Pescara.—This river enters the sea after flowing between Pescara-Porta Nuova (Pescara), situated on the southern bank about half a mile from its mouth, and Pescara-Riviera di Castellammare, on the opposite bank close to its mouth. Two moles, quayed and furnished with bollards, extend from the mouth of the river, leaving a narrow entrance; the north-western mole extends 2½ cables north-eastward, and the south-eastern extends about 2½ cables north-north-eastward. There are depths of about 10 feet (3^m0) alongside the south-eastern mole, which is connected to the railway system. Vessels, with local knowledge, find the best shelter in the space near the road bridge. It is difficult to enter with the wind in the north-eastern quadrant.

The harbour is liable to silt and vessels drawing more than 6 feet 35 (1^m8) must not enter.

There are two groynes, each about 55 yards (50^m0) long, and 175 yards (160^m0) apart, about 2½ cables north-westward of the moles.

A vessel bound for Fiume Pescara from north-eastward should steer for the land midway between Monte Maiella and Monte Corno until the 40 towns, which are low and visible only at a short distance, are sighted; they appear white against the valley between the two mountains. The town of Spulture and its convent stand on a hill with two peaks, close together and of about equal height, 4 miles westward of the mouth of Fiume Pescara.

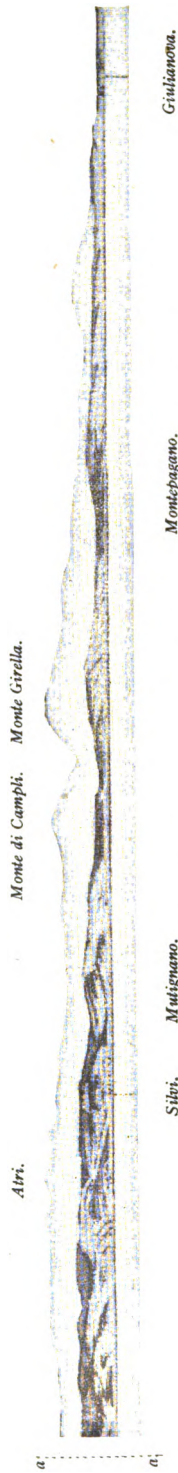
45 Two metal bridges cross the river between the two towns. A square tower on a hill at the back of the town on the southern side of the river, is conspicuous, also the tower of the municipal buildings on the northern bank, near one of the bridges.

Light.—A light is exhibited, at an elevation of 25 feet (7^m5), 50 from a red column on a square hut, 18 feet (5^m5) in height on the head of the south-eastern mole (*Lat.* 42° 28' N., *Long.* 14° 14' E.).

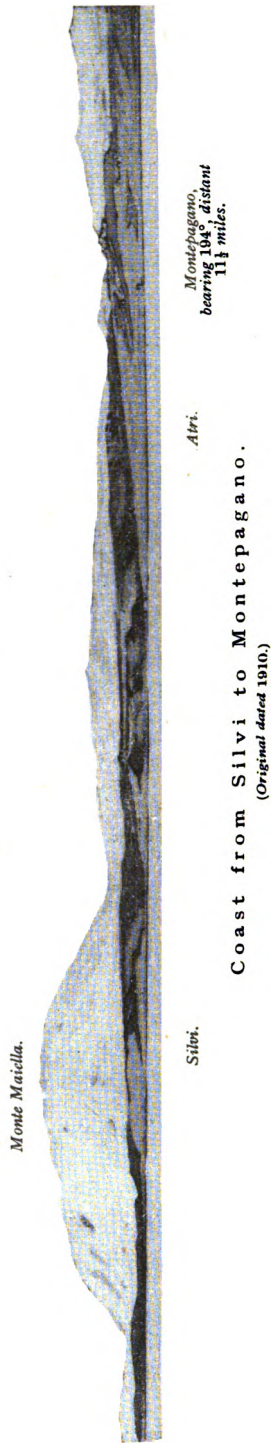
Anchorage.—There is anchorage at a distance of about 1½ miles off the mouth of Fiume Pescara, in depths of from 6 to 8 fathoms (11^m0 to 14^m6), mud, good holding ground, with the mouth of the river

Charts 1440, 2158a, 2158b.

To face page 551.



View in 2 parts of coast from Pescara to Giulianova.
(Original dated 1910.)



Coast from Silvi to Montepagano.
(Original dated 1910.)

Chart 200.

well open, or at a distance of a mile farther out, in a depth of 9 or 10 fathoms (16^m5 or 18^m3).

Towns.—The two towns contained about 35,900 inhabitants, in 1939. They are connected to the general railway system. 5

There is a small civil hospital.

The principal imports are wood, coal, bauxite, nitrates, cereals, cement, iron, and chemical manures; the exports are asphalt, aluminium, and grain.

There are facilities for loading and unloading vessels at anchor. 10

On the southern side of the harbour, there are some cranes, one of which is mobile and has a capacity of 6 tons.

Coast.—From the mouth of Fiume Pescara, westward of which there is a large pine forest, to the mouth of Fiume Tronto, 29 miles north-north-westward, the coast is low, sandy and sparsely inhabited. 15 Conspicuous objects are: the isolated Città Sant' Angelo, elevated 1,050 feet (320^m0), with a high white belfry, situated about 7½ miles north-westward of the mouth of Fiume Pescara and 3 miles inland; the village of Silvi, situated on a hill, 787 feet (239^m9) high, about 8 miles north-westward of the same river mouth and half a mile 20 inland; Torre di Cerrano, 1½ miles northward of Silvi, consisting of two square and embattled buildings, one above the other, the upper being the smaller; the three belfries of the village of Atri, the southernmost being the largest, situated, at an elevation of 1,450 feet (442^m0), about 5½ miles west-north-westward of Torre di Cerrano; the town of 25 Mutignano, situated, at an elevation of 1,053 feet (321^m0), about midway between Atri and the coast; the town of Montepagano, which has a tall sharp belfry at its northern end and a remarkable cupola at its southern end, and also some chimneys, situated about 5½ miles north-north-westward of Mutignano; the town of Giulianovo, on a 30 hill, about 4½ miles farther north-north-westward and a short distance inland; and the town of Tortoreto, with its two belfries, on a hill between Giulianovo and Fiume Tronto. The mouth of Fiume Casone or Vibrato is situated about 2½ miles north-north-eastward of Tortoreto (Lat. 42° 48' N., Long. 13° 55' E.). See views facing this page. 35

This stretch of coast is intersected by numerous streams, each of which gives rise to an accumulation of deposit at its mouth. All become dry in summer with the exception of Fiume Saline and Fiume Vomano; the mouth of the latter is crossed by a bridge with nineteen arches. Fishing vessels occasionally ascend these two rivers. 40

Giulianovo.—This town, which contained, in 1939, about 4,100 inhabitants, is situated partly on the slope of a hill, 200 feet (61^m0) high, and partly on the coast. The principal imports are leather and hardware and the exports, grain, wine and raw hides.

On a near approach, the principal square of the town, with a statue 45 in the middle, and the large cupola of a church are conspicuous.

Giulianovo is connected to the railway system.

Harbour.—**Light.**—The harbour is formed by two moles, the roots of which are about 2½ cables apart; the southern mole extends about 2½ cables offshore, close eastward of the railway station, and the 50 northern mole extends about 1½ cables east-north-eastward and then half a cable south-eastward.

On the northern side of the entrance, there are depths of about 2½ fathoms (5^m0). Alongside the outer arm of the northern mole,

Charts 1440, 2158a, 2158b.

Chart 200.

there are depths of about 13 feet (4^m0). A vessel entering or leaving the harbour should keep towards the northern mole.

In 1941, works were in progress to extend the southern mole.

- 5 A light is exhibited, at an elevation of 20 feet (6^m1), from a framework structure on an iron hut, 13 feet (4^m0) in height, on the southern molehead (*Lat.* 42° 45' N., *Long.* 13° 59' E.).

- 10 **Fuel and supplies.**—The State railways usually have about 1,000 tons of coal in stock. Fresh provisions can be obtained in limited quantities.

Coast.—The mouth of Fiume Tronto is situated about 9 miles northward of Giulianovo. There is a depth of about 3 feet (0^m9) at its entrance at high water, when small coasters can ascend it for a distance of about half a mile.

- 15 The town of Colonnella stands on a hill, 994 feet (303^m0) high, about 3 miles west-south-westward of the mouth of Fiume Tronto, and points out its position ; a church with a campanile stands detached from the town.

See views facing this page.

- 20 **Light.**—A light is exhibited, at an elevation of 10 feet (3^m0), from a red hexagonal masonry hut, 8 feet (2^m4) in height, on the southern side of the entrance to Fiume Tronto.

Charts 1440, 2158a, 2158b.

Monte Camicia.

Monte Corno.



Giulianova,
bearing 213°, distant 8 miles.

Montone.

Monte di Campli.

Monte Girella.

Monti Sibillini.



Tortorido.

View in 2 parts of coast from Giulianova to Colonnella.
(Original dated 1910.)

Colonnella.

Monte Corno or
Gran Sasso d'Italia.

Monte di Campli.

Monte Girella.



Mouth of the Fiume Casone
or Vibrato.

Colonnella.



bearing 256°, distant
4½ miles.

View in 2 parts of coast from Fiume Casone or Vibrato to Fiume Tronto.

Monte
Prandone.

Mouth of
Fiume Tronto.

(Original dated 1910.)

CHAPTER XI

COAST OF ITALY FROM FIUME TRONTO TO PUNTA DEL TAGLIAMENTO

Charts 200, 201.

COAST.—General remarks.—From Fiume Tronto to Fiume Po di Goro the distance, following the coastline, is about 144 miles. Between Fiume Tronto and Monte Conero (*Lat.* $43^{\circ} 33' N.$, *Long.* $13^{\circ} 37' E.$), near Ancona, the coast is generally low and sandy; hills occur at long intervals, in continuation of the Apennines, but do not reach within half a mile of the coast except between Cupra Maritima and Porto San Giorgio, where it is steep. These hills are well cultivated and dotted with towns and villages.

At Rimini, the coast becomes low and sandy, and so continues to Punta della Maestra, and beyond it to the north-western end of the head of Golfo di Trieste. Between Rimini and Cervia, towns and villages are visible in the midst of a large cultivated plain; but, beyond the latter town, the coast is intersected by marshes; and, inland, is the largest pine forest of Italy, extending from Ravenna to Fiume Po di Primaro.

The rivers and streams which run into the sea north-westward of Ancona bring down a great quantity of soil, causing a gradual extension of the land seaward. The banks thus formed vary so often in shape and extend so far off that it is not prudent for vessels to approach this coast in bad weather. Where the land is high, rocks here and there border the shore and render it difficult of access, even to boats.

Outlying buoys.—A number of buoys have been established on a line extending in a north-north-westerly direction from Ancona towards the head of the Adriatic:

No. 1, a mooring buoy, painted black, with a red globe topmark in lat. $43^{\circ} 54' N.$, long. $13^{\circ} 25' E.$

No. 2, a buoy, painted in black and white bands, with a globe topmark, in lat. $44^{\circ} 09' N.$, long. $13^{\circ} 20' E.$

No. 3, a mooring buoy with a black and white topmark, in lat. $44^{\circ} 24' N.$, long. $13^{\circ} 15' E.$

No. 4, a mooring buoy, painted black, with a black and white ball topmark, in lat. $44^{\circ} 40' N.$, long. $13^{\circ} 09' E.$

No. 5, a buoy in lat. $44^{\circ} 55' N.$, long. $13^{\circ} 04' E.$

No. 21, a can buoy, painted black, with black and yellow superstructure, in lat. $45^{\circ} 15' N.$, long. $12^{\circ} 57' E.$

Charts 1440, 2158a.

Charts 200, 201.

Of the above buoys, Nos. 4, 5 and 21 lie nearly midway between the coasts of Italy and Istria.

The light-buoy in the approach to Ancona is described on page 558.

- 5 **Dumping ground.**—A dumping ground for explosives, indicated on chart 201, has been established in approximately lat. 45° 08' N., long. 12° 59' E.

- Anchorage.**—**General remarks.**—Small vessels may anchor anywhere between Fiume Tronto and Cesenatico, half a mile offshore, especially in front of the towns and villages; and, between Cesenatico and the southern mouth of Fiume Po delle Tolle, about 35 miles northward, 1½ miles offshore; but all these anchorages, though good with offshore winds, are dangerous with others, and care should be taken not to be surprised by them. In case of need, vessels of deep draught
15 may anchor about 3 miles offshore, where good holding ground of hard mud will be found. Between Fiume Tronto and Monte Conero, the anchorages are only good with offshore winds or in fine weather. On coming to an anchor at night or in foggy weather, along this part of the coast, care should be taken not to stand into a less depth than
20 9 to 12 fathoms (16^m5 to 21^m9).

- Between Sirolo and Ancona, the coast is high and perpendicular, with moderately deep water close to, and vessels should not anchor here except in case of necessity. Between Ancona and Rimini, the high lands of the Apennines decline to within about half a mile of the
25 coast; and, in some places, as at Ancona and Pesaro, to the margin of the sea.

- Between Ancona and Punta della Maestra, in addition to not approaching the coast too closely, it is necessary to ascertain the nature of the bottom should a vessel bring up, for anchors frequently
30 drag, particularly between Rimini and Punta della Maestra, on account of the great hardness of the clay.

- Between Fiume Tronto and Punta della Maestra, Ancona harbour is the only place deserving the name of a port and capable of admitting vessels of moderate draught. The rest, formed chiefly by mouths
35 of rivers, are difficult of access, and only suitable for coasters.

Chart 200.

- Coast.**—**San Benedetto del Tronto.**—This town (Lat. 42° 57' N. Long. 13° 53' E.), which had a population of 12,350, in 1939, lies about 4 miles north-north-westward of the mouth of Fiume Tronto.
40 It is situated partly along the shore and partly on the slopes above, close northward of the mouth of Torrente Albula (Albero); a bridge with three arches crosses the latter.

- The square belfry of the cathedral, ending in a pyramid, is conspicuous, and in front of it there is a clock tower. A large yellow
45 bathing establishment stands on the beach, and from the anchorage the town of Acquaviva can be seen, situated on a hill, 3 miles westward of San Benedetto. Southward of the town, on a little hill, is a large black wooden cross.

- San Benedetto is connected to the railway system. Fishing is the
50 principal industry.

Harbour.—**Light.**—The harbour is formed by two moles: the northern mole extends in a general east-south-easterly direction from a position about half a mile northward of the bridge over Torrente Albula; the southern mole extends in a general north-easterly direction

Charts 1440, 2158a.

Monte Prandone.

Acquaviva.

Ripatransone.



Mouth of
Fiume Tronto.

Torre d'Ascoli.

San Benedetto del Tronto,
bearing 305° distant
9 miles.



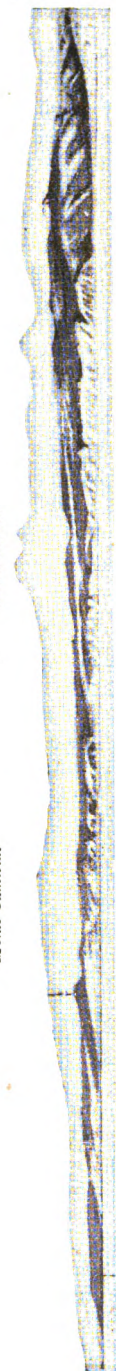
Grottammare.

Campofilone.

View in 2 parts of coast from Fiume Tronto to abrest Campofilone.
(Original dated 1910.)

Monte Camicia.

Monte Corno.



Mouth of
Fiume Tronto.

Colonnella.

Fermo,
bearing 249° distant
9 1/2 miles.

Monti Sibillini.

Monte-
rubiano.



Ripatransone.

Torre di Palme.

Porto San Giorgio.

View in 2 parts of coast from Fiume Tronto to Porto San Giorgio.
(Original dated 1910.)

Chart 200.

from the northern side of Torrente Albula. There is a small quay at the root of the northern mole; water is laid on to this quay. The harbour is frequented by fishing craft, and is subject to silting; in 1939, vessels drawing more than 10 feet (3^m0) could not enter. 5

A light is exhibited, at an elevation of 23 feet (7^m0), from the head of the northern mole at San Benedetto (*Lat.* 42° 57' N., *Long.* 13° 53' E.).

Anchorage.—There is anchorage in fine weather, about a mile offshore abreast the town, in a depth of 5½ fathoms (10^m1); small 10 vessels can go closer in.

Coast.—The mouth of Torrente Tesino, crossed by a bridge with five arches, lies about 2 miles northward of San Benedetto, and the village of Grottammare (Grottamare), which had a population of 3,000 in 1939, stands partly on the slopes of a hill and partly on the 15 beach, about a mile farther northward. The houses in the high part of this village are dominated by an old tower with a flagstaff. Southward of the village there are some groynes, and large rocks are visible along the beach. The village is connected to the railway system.

Ripatransone, 1,667 feet (508^m1) high, situated about 5 miles westward of Grottammare, is one of the most characteristic peaks along this stretch of coast; it is easily identified by its three conspicuous towers. 20 Seen from south-eastward, its summit appears level, whilst from north-eastward, its summit appears undulating. See view facing this page. 25

The village of Cupra Marittima (Marano) is situated on the summit of a small hill, close to the coast, about 1½ miles northward of Grottammare.

The coast between Fiume Tronto and Cupra Marittimo is bordered by a shallow bank, about half a mile wide, and landing is impossible 30 except in fine weather. Monte Vettore (*Lat.* 42° 50' N., *Long.* 13° 17' E.), 8,123 feet (2475^m9) high, standing about 27 miles west-south-westward of Grottammare is conspicuous. This mountain (chart 1440), the southernmost of Monti Sibillini, forms a part of the Apennine chain, and is easily distinguished by its barren summit and by several 35 whitish peaks at a short distance from each other.

Torrente Monocchia flows through a wide valley and enters the sea about a mile northward of Cupra Marittima, and the mouth of Fiume Aso is situated about 4 miles farther northward. On the hills, westward of the coast between these two streams, are the villages of 40 Massignano, about 2½ miles inland, and Campofilone, about 1½ miles inland, and half-way up the hill, southward of the valley of Fiume Aso, is Pedaso lighthouse.

The village of Pedaso, which contained 950 inhabitants in 1939, lies amongst trees on the southern side of the mouth of Fiume Aso; 45 this village is connected to the railway system. A breakwater extends from the village and there are two short protecting groynes. The mouth of Fiume Aso is crossed by a bridge with six arches.

The steeples of Altidona and Lapedona, on the summits of hills, 732 and 866 feet (223^m1 and 264^m0) high, respectively, are conspicuous; 50 the former is situated 2½ miles, and the latter, 3 miles, west-north-westward of Pedaso. Monterubbiano, 1,519 feet (463^m0) high, 5½ miles westward of Pedaso, can be identified by its two campaniles, the northern of which is the more conspicuous.

Charts 1440, 2158a.

Chart 200.

5



10

Pedaso lighthouse.

Light.—A light is exhibited, at an elevation of 164 feet (50^m0), from an octagonal tower and dwelling, 61 feet (18^m6) in height, situated about half a mile southward of Pedaso (Lat. 43° 05' N., Long. 13° 51' E.). The name "*Faro di Pedaso*" is painted in black letters on this lighthouse.

Coast.—Torre di Palme, a small village on the summit of a green hill, 393 feet (119^m8) high, with a remarkable square tower, lies about 2½ miles northward of Pedaso. Porto San Giorgio is situated about 2½ miles northward of Torre di Palme, with Fiume Ete vivo midway between.

The town of Fermo is situated on a hill, 1,047 feet (319^m1) high, about 4 miles west-south-westward of Porto San Giorgio; this village, with its large church and campanile, dominates all the hills in the vicinity and is conspicuous.

Porto San Giorgio, which contained 6,800 inhabitants, in 1939, is the port of Fermo. There are a fort with a square central tower, some conspicuous chimneys and a railway station in the town.

Vessels can find temporary anchorage off Porto San Giorgio in fine weather; the coast in the vicinity is lower than any other part and is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about a mile wide. See view facing page 555.

The mouth of Fiume Tenna is situated about 3½ miles northward of Porto San Giorgio, and Porto Sant'Elpidio, about 1½ miles farther northward; there is a railway station at the latter port.

The town of Sant'Elpidio a Mare stands on a hill, 823 feet (250^m8) high, about 3½ miles south-westward of Porto Sant'Elpidio. It contains a square tower standing among three campaniles and is conspicuous.

The mouth of Fiume Chienti is situated between Porto Sant'Elpidio and Porto Civitanova, about 3 miles northward. Fishing boats can enter the mouth of Fiume Chienti at high water. The coast at the mouth of this river, seen from Porto Sant'Elpidio, appears as a low sandy tongue projecting seaward. About half a mile from its mouth, this river is crossed by a large bridge on six masonry piers.

Porto Civitanova, which had a population of 8,200, in 1939, contains a conspicuous house with a portico. Vessels can anchor, in a depth of 5½ fathoms (10^m1), about a mile offshore, and small vessels, in a depth of 2½ fathoms (4^m1), about 2 cables offshore. A short mole, with an arm, inclined towards the beach, at each end, has been constructed about 3 cables off the shore and lying parallel with it; this mole protects a small pier extending off the village.

There is a slip for wooden craft up to 200 tons; glass, iron and bronze alloys and railway cars are manufactured. The port is connected to the railway system.

The city of Civitanova, which stands on a hill, 509 feet (155^m1) high, about 2½ miles west-north-westward of Porto Civitanova, has three campaniles and a square tower at its southern end. Montecosaro, 2 miles farther westward, is dominated by a square campanile. Both are good landmarks.

The town of Macerata is situated in the valley of Fiume Chienti, about 12 miles westward of Porto Civitanova, with which it is connected by railway.

Charts 1440, 2158a.

Santi' Elpidio.



Monte San Vicino.

bearing 275° distant
7½ miles.

Recanati.

Civitanova.

a

a

*Porto
Civitanova.*

Lorido.

Monte Conero.

View in 2 parts of coast from Porto San Giorgio to Monte Conero.
(Original dated 1910.)

Monte Vetore.

Monti Sibillini.

Recanati.



Fermo.

Monte San Vicino.

Civitanova.

Tower.

Polenza Picena.

Lorido.

a

a

*Li. Ho.
Ancona.*

*Monte Conero,
Tower bearing 280°, distant 9½ miles.*

View in 2 parts of coast from Fermo to Ancona.
(Original dated 1910.)

Chart 200.

Monte San Vicino, 4,672 feet (1424^m) high, is situated about 18 miles westward of Macerata and has a trapezoidal summit; it is one of the most conspicuous objects for a length of about 100 miles along the coast to beyond Rimini. *See* views facing this page. 5

Porto Potenza Picena is situated about 3½ miles north-north-westward of Porto Civitanova. It has a square tower, surmounted by a small belfry, near its southern end, and a small bridge crosses the mouth of Torrente Fosse di Mare in front of the tower. A large red building on the coast between Porto Civitanova and Porto Potenza 10 Picena is conspicuous. Vessels can anchor off Porto Potenza Picena, in a depth of about 5 fathoms (9^m), southward of the tower, about half a mile offshore.

The town of Potenza Picena stands on a hill, 778 feet (237^m) high, about 3 miles inland; it is easily distinguished by a high square tower 15 surmounted by a flagstaff and by a sharp pointed campanile.

Porto Recanati, about 4½ miles north-north-westward of Porto Potenza Picena, contained 3,600 inhabitants, in 1939; at its northern end stands a square clock tower and there is a conspicuous chimney at the southern end of the village. There is a railway station and a short 20 pier. Coasters anchor off the village.

The city of Recanati stands on a hill, 961 feet (292^m) high, about 5 miles west-south-westward of Porto Recanati. The dome and tower of Loreto, situated 2½ miles westward of Porto Recanati, on a hill, 417 feet (127^m) high, are conspicuous. *See* views facing this 25 page.

Fiume Potenza flows into the sea about half a mile southward of Porto Recanati, and Fiume Musone, about 2½ miles northward.

Light.—A light is exhibited, at an elevation of 36 feet (11^m), from a tower on a circular hut, situated on the beach at Porto Recanati 30 (Lat. 43° 26' N., Long. 13° 40' E.).

Coast.—The village of Numana, about 5 miles northward of Porto Recanati, is divided into two parts by a small projection on which stands a tower, appearing as an isolated arch. There is a shallow boat harbour here, protected by a short mole and open south-east- 35 ward. This village had a population of 1,100, in 1939. The village of Sirolo, about three-quarters of a mile northward of Numana, stands on a hill close to the coast and contains a square clock tower. In case of need, vessels may anchor off Sirolo, in a depth of 6½ fathoms (11^m), mud, sheltered by the base of the mountain from gales between north- 40 north-west and south-west.

The coast rises steeply at Sirolo and forms Monte Conero, the most striking headland for many miles. It rises almost perpendicularly from Punta Mezzaluna, about 1½ miles northward of Sirolo; between this point and Ancona lighthouse the range of hills presents a front of 45 about 7 miles facing north-eastward. Monte Conero, at the south-eastern end of the range, is 1,877 feet (572^m) high and double the height of any other peak; its summit is covered with dark vegetation, while the sides are bare and white, especially the steep eastern slope. On it stands an isolated tower, which marks the mountain from a great 50 distance seaward; a convent stands half a mile south-eastward of the tower. The mountain gradually decreases in height north-westward and the range terminates in Monte Guasco near the northern end of Ancona. *See* view facing this page.

Charts 1440, 2158a.

Chart 200.

Scogli Le due Sorelle, situated close off Punta Mezzaluna, are two conical above-water rocks and are conspicuous from north-westward and south-eastward. The church of Porto Nuovo, with some houses
 5 near it, stands on the coast, about $1\frac{1}{2}$ miles north-westward of Le due Sorelle; from this church, for a distance of about half a mile west-north-westward, a tongue of sand, about half a cable wide extends off the foot of the mountains. A conspicuous square grey tower stands
 10 on the north-eastern side of this tongue. Montirizzo, 590 feet (180^m) high, stands a short distance inland, about $1\frac{1}{2}$ miles west-north-westward of this tower.

Porto Nuovo is entered between the sandy tongue just described and Scogliera Trave, a ledge forming a natural breakwater, about $1\frac{1}{2}$ miles north-westward. This harbour is bordered by a narrow
 15 shallow bank; sunken rocks exist on this bank at distances of about $1\frac{1}{2}$ cables north-westward, and one cable northward of the northern extremity of the sandy tongue. Scogliera Trave extends about half a mile offshore, in an east-south-easterly direction; the inner half
 20 being above water, with some mooring posts on it, and the outer half being submerged, having depths of less than 6 feet (1^m 8) over it, and depths of about $5\frac{1}{2}$ fathoms (10^m 1) close off each side. The general depths in the harbour are less than 5 fathoms (9^m 1), gravel.

A rocky shoal, with a depth of $4\frac{1}{2}$ fathoms (7^m 8) over it, lies about $3\frac{1}{2}$ cables north-eastward of the inner end of Scogliera Trave (*Lat.*
 25 $43^\circ 35' N.$, *Long.* $13^\circ 34' E.$).

Off-lying light-buoy.—A light-buoy, exhibiting a *white flashing* light, *every three seconds*, is moored in the south-eastern approach to Ancona, about 13 miles eastward of Punta Mezzaluna.

Anchorage.—Directions.—In the south-eastern part of Porto
 30 Nuovo vessels can find good anchorage, sheltered from southerly winds, eastward of Montirizzo, in a depth of $3\frac{1}{2}$ fathoms (6^m 9), with the square tower in line with a conical rock at the foot of Monte Conera, bearing 121° .

The northern part of the harbour, sheltered by Scogliera Trave, is
 35 a refuge for small craft which are unable to reach Ancona during a Bora.

When proceeding to the northern anchorage from northward, a vessel should steer with the square tower, on the sandy tongue, in line with the tower on the summit of Monte Conero, bearing about
 40 152° , and not haul in for the anchorage until the inner part of Scogliera Trave is visible and she is southward of the submerged portion.

Coast.—The coast between Scogliera Trave and Ancona, about $3\frac{1}{2}$ miles north-westward, is high and steep, with precipitous light-coloured patches; it is fringed by rocks, few of which are visible until
 45 close inshore.

Chart 3212.

ANCONA.—This town has the only harbour in this part of the Adriatic capable of receiving large vessels; it is built on sloping land, remarkable for the whitish appearance of its soil, in the form of an
 50 amphitheatre, and lies between two low hills; the cathedral of San Ciriaco, with a detached campanile, stands on Monte Guasco, the northern hill, already mentioned; the citadel stands on Monte Astagno, the southern hill, about three-quarters of a mile southward.

Charts 1440, 2158a.

Chart 3212.

An area, about 2 cables long, has been reclaimed and quayed northward of the foot of Monte Guasco. The north-eastern side of this area is fringed by a shallow bank, about a quarter of a cable wide, on which there are some sunken rocks, known as Scogli San Clemente. 5

Danger in approach.—Beacon.—Buoy.—A shallow bank extends about $1\frac{1}{4}$ cables north-north-westward from the northern extremity of the reclaimed area, just described. Scoglio Volpe, an above-water rock, is situated near the middle of this bank and is marked by a black iron beacon, 21 feet (6^m4) high, surmounted by a staff with a red flag; this beacon is liable to be washed away. A bank, with depths of less than 5 fathoms (9^m1) over it, extends three-quarters of a cable northward and north-westward of this rock. A vessel should give these dangers a wide berth, as the current is strong in the vicinity. At night, the light on the head of the northern mole at Ancona, bearing less than 230° , leads north-westward of the bank extending from Scoglio Volpe. 15

A can buoy is moored about $1\frac{1}{4}$ miles west-north-westward of Colle Cappuccini lighthouse. 20

Light.—Caution.—A light is exhibited, at an elevation of 407 feet (124^m0), from a circular tower on a dwelling, 65 feet (19^m8) in height, on Colle Cappuccini (*Lat.* $43^\circ 27' N.$, *Long.* $13^\circ 31' E.$), situated 2 cables south-eastward of the cathedral and a short distance inland. 25

Owing to its height, this light very often cannot be seen in hazy weather.

Signal station.—A signal station, consisting of a square grey tower, is situated, at an elevation of 410 feet (125^m0), about three-quarters of a cable south-eastward of Colle Cappuccini lighthouse. See page 46. 30



Colle Cappuccini lighthouse.

Storm signals are displayed at this signal station, see page 43. The station will transmit, by telegraph, messages received from ships. 35

Pilots.—Pilotage is not compulsory. Pilots usually are to be found within a radius of 5 miles from the entrance to the port, weather permitting. It is advisable to give previous notice to the Port authorities if a pilot is required. In strong northerly winds, the pilots do not go outside, and a vessel, awaiting a pilot, should make for the pilot boat, which will be lying within the entrance. 40

Anchorage.—The anchorage off Ancona is in depths of from 7 to 11 fathoms (12^m8 to 20^m1), mud, good holding ground; it is available only in fine weather and is seldom resorted to except by vessels prevented by contrary winds from entering the harbour, or as a temporary anchorage. A good berth is, in a depth of 8 fathoms (14^m6), mud, with the town of Falconara Marina, on the coast about $4\frac{1}{4}$ miles westward of Ancona, bearing 258° , and the light-structure on the head of the northern mole, bearing 166° , distant one mile. 50

This anchorage is, at times, rendered uncomfortable by the prevailing current which sets eastward and causes a vessel to lie across the swell sent in by northerly winds. It is exposed to the Bora, which are, however, rarely felt at Ancona, and to north-westerly

Charts 200, 1440, 2158a.

Chart 3212.

- winds. South-easterly winds also cause a heavy sea in the road, and heavy squalls off the land are occasionally felt.

Small vessels can anchor, during the summer, westward of the head of the spur extending from Molo Sud, in depths of from $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms (7^m8 to 10^m1), good holding ground.

Harbour.—The harbour is formed by moles constructed westward of the town and can accommodate vessels drawing up to 24 feet (7^m3). A vessel, drawing 23 feet (7^m0) or over, should enter at high water as the least depth in the entrance is 25 feet (7^m6). The bottom in the entrance consists of mud and soft sand. North-westerly gales cause a considerable sea and sometimes prevent vessels working cargo.

The northern mole extends about 6 cables in a general westerly direction from the northern end of the town. Molo Traiano is situated at its inner end, with Molo Clementino between it and Molo Nord. The latter is about $1\frac{1}{2}$ cables long and lies in a west-north-westerly direction, with a projection, also about $1\frac{1}{2}$ cables long, extending westward from its outer end. Molo Luigi Rizzo extends about a cable south-westward from Molo Traiano. A spur extends about half a cable south-south-westward from the eastern end of Molo Nord, and a shorter spur extends south-south-eastward from the western end of the same mole.

Molo Sud extends about 5 cables in a general northerly direction from the southern end of the town. A short, rough stone jetty projects north-north-eastward from the northern end of Molo Sud. From the western side of Molo Sud, at a distance of about a cable from its northern end, a narrow stone jetty extends about 2 cables in a north-westerly direction (*Lat.* $43^\circ 37' N.$, *Long.* $13^\circ 30' E.$).

The channel at the entrance between the outer moleheads is 1,090 feet (322^m2) wide, and that between the inner moleheads is 480 feet (146^m3) wide.

On the eastern side of the harbour, two moles project about three-quarters of a cable from the quay which faces the town; Pontile Costanzo Ciano from abreast the Customs house; and Pontile Trape-zoidale about a cable farther northward. Both these moles and Molo Luigi Rizzo are connected to the railway system.

Regulations concerning aircraft.—1. During the arrival or departure of seaplanes, the whole of the central area of the harbour as well as the entrance and the approach to Bacina del Mandracchio, situated at the southern end, should be left clear.

2. All small craft which are under way should proceed immediately to the nearest quay.

3. Vessels preparing to leave the port should not move until the alighting or departure of the seaplane has been completed.

4. The arrival or departure of seaplanes is signified by three blasts on the siren ten minutes before alighting or departing and repeated two minutes before such manoeuvre commences.

At the first blast of the siren a green flag will be displayed on the flagstaff at the aerodrome, near the root of Molo Sud, and will remain so until the manoeuvre is completed.

Lights.—Fog signal.—Beacon.—A light is exhibited, at an elevation of 40 feet (12^m2), from an iron pyramidal framework structure on a square base, 31 feet (9^m4) in height, on the head of the mole extending westward from Molo Nord.

Charts 200, 1440, 2158a.

Chart 3212.

A fog signal is sounded from this light structure.

A light is exhibited, at an elevation of 20 feet (6^m1), from a black iron pyramidal structure on a black concrete hut, 28 feet (8^m5) in height, on the head of the jetty extending from the western side of Molo Sud. 5

A beacon stands on the head of the spur extending south-south-eastward from the western end of Molo Nord.

A light is exhibited, at an elevation of 33 feet (10^m1), from a black iron post on a concrete hut, 20 feet (6^m1) in height, on the head of the stone jetty projecting from the northern end of Molo Sud. 10

A light is exhibited, at an elevation of 25 feet (7^m6), from a red iron framework structure on a concrete hut, 18 feet (5^m5) in height, on the head of the spur extending south-south-westward from the eastern end of Molo Nord. 15

A light is exhibited from one of the radio masts situated about 1½ miles south-westward of the port.

Depths.—Berths.—There are depths of from 4 to 5 fathoms (7^m3 to 9^m1), soft, dark mud, in the northern part of the harbour, and depths of less than 3 fathoms (5^m5), mud over rock, in the southern part. 20

Vessels drawing 29 feet (8^m8) can be berthed alongside the outer projection of the northern mole. Vessels drawing 19 feet (5^m8) could, in 1943, lie alongside both sides of Molo Luigi Rizzo, or could be moored in the basin close eastward. In the same year, a vessel, drawing 19 feet (5^m8), could berth alongside the eastern side of the northern end of Molo Sud, or alongside the northern side of Pontile Costanzo Ciano; vessels, drawing from 11 to 15 feet (3^m4 to 4^m6), could lie alongside the north-eastern side of Molo Sud, and the southern sides of Pontile Trapezoidale and Pontile Costanzo Ciano. Large vessels can berth with their sterns towards the stone jetty projecting north-westward from Molo Sud. 25 30

Town.—The city of Ancona conducts almost the whole of the commerce of this part of the Adriatic. The population, in 1939, was 57,100.

There is a large hospital. 35

A British Consular officer resides in the town.

There is a meteorological observatory at Colle Cappuccini signal station (*Lat.* 43° 37' N., *Long.* 13° 31' E.).

Communications.—There is regular steamer communication with the principal ports in the Adriatic and Mediterranean seas. 40

Ancona is connected to the general railway system. There is a radio station, *see* page 46.

Trade.—The principal imports are coal, phosphates, jute, pyrites and timber; the principal exports are agricultural products, asphalt rock, raw sulphur and refined sugar. 45

Port facilities.—Repairs to hull and machinery can be executed. There is a patent slip for the use of vessels up to 500 tons; *see* Appendix I, page 602. Tugs are available. Electricity can be supplied to vessels alongside the quays.

Deratisation can be carried out, *see* page 50. 50

Fuel and supplies.—There are small stocks of coal kept by private firms besides a large stock of coal and patent fuel belonging to the State railways.

There is a government stock of fuel oil.

Charts 200, 1440, 2158a.

Chart 3212.

Fresh provisions are plentiful and water is laid on to the quays.

Time signal.—A time signal is made from a mast at Colle Cappuccini signal station (*Lat.* 43° 37' N., *Long.* 13° 31' E.), at noon standard time, and a gun is fired simultaneously.

Winds and weather.—Easterly winds sometimes blow freshly. In summer, westerly winds blow in the morning and south-easterly during the day.

Troublesome winds for this harbour are those from north-westward; westerly, south-westerly and north-easterly winds raise a considerable swell.

Clouds on the summit of Monte Conero are said to foretell south-easterly winds, and on the mountains round Ancona, north-easterly winds. An extraordinary amount of water in the harbour foretells a Bora, or bad weather from southward.

Fogs in winter, accompanied by calms, are dense and frequent. See also Local winds, western shore of the Adriatic, page 16, and Visibility, page 19.

Meteorological tables, see page 32.

Charts 3212, 200.

Directions.—Monte Conero is a good mark for a vessel approaching Ancona; in clear weather, Monte San Vicino, page 557, situated 27 miles south-westward of the town, may also be seen from the offing. In foggy or hazy weather, when coming from eastward care should be taken not to mistake Monte Ardizio, near Pesaro, for Monte Conero; the latter is higher, and may be easily distinguished by the objects on it already described; portions of the land near it are like the high ground in the vicinity of the Needles, Isle of Wight.

On nearing the land, the lighthouse on Colle Cappuccini will be identified, then the town, and lastly the head of the northern mole. Care must be taken to guard against the current, which sets strongly south-eastward in the vicinity of Ancona; when the inshore part reaches the bend of the coast, it turns and flows northward along the southern mole, setting towards the head of the northern mole, often with great force, after which it follows the trend of the coast.

At night, the light on the head of the northern mole, bearing less than 230°, leads one cable north-westward of Scoglio Volpe and the bank extending from it.

Chart 200.

COAST.—Between Ancona and Senigallia, about 14 miles west-north-westward, the coast is low, sandy and bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about 1½ miles wide. It is intersected by several rivers of which the most important is Fiume Esino, which flows into the sea about 6 miles west-north-westward of Ancona. Fishing boats can ascend Fiume Esino at high water. The village of Chiavalle lies 3 miles inland.

Montagnolo, a hill, 869 feet (264^m9) high, and of a sugarloaf shape, stands about 2½ miles south-westward of Ancona; there is a group of buildings with a chimney at the base of this hill. Monte Bercaglione, 673 feet (205^m1) high, is situated about 3 miles north-westward of Montagnolo and a mile inland.

The village of Falconara Alta stands on a hill, 387 feet (118^m0) high, about 1½ miles south-eastward of the mouth of Fiume Esino and a

Charts 1440, 2158a.

Monte Conero.
Summit 1371°. 13½ miles.

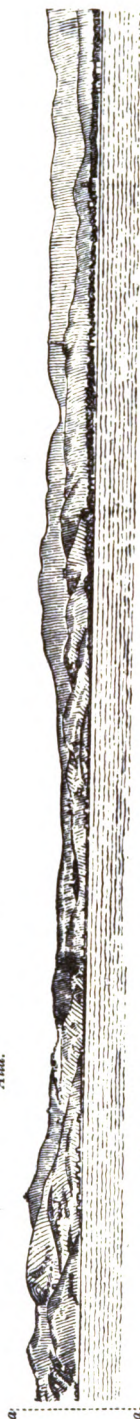
Montagnolo.



Light-house.

*Falconara
Alta.*

Torrette.



Rocca Priora.

Chiaravalle.

View in 2 parts of coast from Ancona to Chiaravalle.
(Original dated 1939.)

Monte San Vito



Case Bruciate.

Montignano.

Scupazzano.

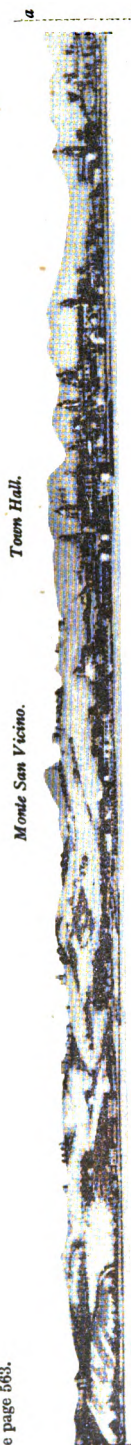
Torre Albani.
Mondolfo



View in 2 parts of coast from Case Bruciate to Senigallia.
(Original dated 1910.)

Porto Senigallia. Li. Ho.

To face page 563.



Borgo la Pace church.

Site of
Lt. Ho. (destroyed),
bearing 206°, distant 8 cables.

Castle.

Casino Rossini.
Castle.

Scoppezzano.



Le Grazie

View in 2 parts of Senigallia.
(Original dated 1910.)



Bridge over
Fiume Metauro.

Madonna del
Metauro church.

Railway
station.

San Paterniano
church.

Monte Gioue.



Porto Fano lighthouse
(destroyed 1944),
bearing 204°, distant
1½ miles.

Bridge
over Torretta Argilla.

View in 2 parts of Porto Fano.
(Original dated 1910.)

Chart 200.

short distance inland ; there is a conspicuous long building in this village. The village of Falconara Marina, which contained a population of 4,300, in 1939, extends along the beach northward of Falconara Alta. A pier, about 7 cables long, extends north-eastward from the beach here ; there are depths of about 27 feet (8^m2) at the head of this pier. The reddish-coloured church with a campanile, the white railway station and the two white roads which descend from Falconara Alta (*Lat.* 43° 37' N., *Long.* 13° 24' E.), one to each end of the village, are conspicuous.

Rocca Priora, a conspicuous building with many windows, stands on the western bank of the mouth of Fiume Esino, and about a mile farther westward, there is a group of conspicuous buildings close to the coast ; Case Bruciate, a village, lies about half a mile westward of this group of buildings. The town of Montemarciano, with a remarkable tower, stands on a hill, 302 feet (92^m0) high, about 1½ miles south-westward of Case Bruciate. The town of Montignano lies about 2 miles north-westward of Montemarciano and half a mile inland ; and Torre Albani, easily seen from any direction, stands on a hill, 367 feet (111^m9) high, about three-quarters of a mile north-westward of Montignano. When bearing about 215°, this tower appears to be connected to the coast by a steep, white road. See views facing page 562.

Chart 200, plan of Port Senigallia.

Senigallia.—The town of Senigallia, which contained 11,400 inhabitants, in 1939, lies on the southern bank of Fiume Misa, near its mouth. There is a cement factory in the town ; timber and chemical manures are imported and cement, grain and sulphur are exported. It is connected to the railway system and there is a hospital. There is a conspicuous bathing establishment, a short distance south-eastward of the entrance to the harbour, and a pier, on the head of which there is a circular building, extends offshore a short distance farther south-eastward. See view facing this page.

Harbour.—The harbour, only suitable for small craft, is entered between two moles, about 70 feet (21^m3) apart, extending from the sides of the mouth of Fiume Misa in a north-north-easterly direction. The eastern mole is about a cable long and the western somewhat shorter. The banks of the river within the entrance are quayed for a distance of about half a mile. The river is crossed by a railway bridge, about 2½ cables within the entrance and by two other bridges farther up. On the western side, just below the railway bridge and opposite the Port Office, there is a narrow opening leading into two intercommunicating basins. In 1945, the bridges were demolished and the remains of the railway bridge obstructed the harbour.

A shoal, with a depth of 5 feet (1^m5) over it, lies about half a cable east-north-eastward of the head of the eastern mole. In 1945, there was a bank, with a depth of 6 feet (1^m8) over it, close northward of the entrance, and a depth of 3 feet (0^m9), a short distance within the entrance, where the moles had been breached ; in the basins there was a depth of about 6 feet (1^m8). The river is subject to freshets which cause the harbour to silt and the banks at the mouth of the river occasionally shift.

Small craft, with local knowledge, can enter the harbour and secure to the quays.

Light.—A light is exhibited, at an elevation of 16 feet (4^m9) from

Charts 200, 1440, 2158a.

Chart 200, plan of Port Senigallia.

the head of the eastern mole at Senigallia (Lat. $43^{\circ} 43' N.$, Long. $13^{\circ} 14' E.$).

Anchorages.—Vessels can anchor with the head of the eastern mole bearing about 204° , distant about $1\frac{1}{2}$ miles, in a depth of 5 or 6 fathoms (9^m1 or 11^m0), sand. Farther out, in depths of from 6 to 14 fathoms (11^m0 to 25^m6), the bottom is mud and better holding ground.

In fine weather coasters anchor from 2 to 3 cables north-eastward of the mole heads, in a depth of about $3\frac{1}{2}$ fathoms (6^m4).

Chart 200.

Directions.—In clear weather the forked summit of Monti di Catria, 5,584 feet (1702^m0) high, situated 27 miles south-westward of Senigallia, may be seen from a great distance. On nearer approach the village and steeple of Scapezzano, on a hill 545 feet (166^m1) high and 2 miles westward of Senigallia, will be seen; the village and tower of Albani on a hill $3\frac{1}{2}$ miles south-eastward; the tall chimney of a sugar mill in the same direction; the chimney of the cement works; and lastly the town of Senigallia with the town hall tower, square, with large windows, conspicuous among the other towers and steeples.

Chart 200, plan of Senigallia.

There are depths of from $1\frac{1}{2}$ to $1\frac{1}{2}$ fathoms (2^m3 to 2^m7) in the passage between the piers, but the banks at the mouth of the river occasionally change their position.

Chart 200.

Coast.—Between Senigallia and Fano, about 12 miles north-westward, the coast is backed by cultivated hills; it is bordered by a bank, the 5-fathom (9^m1) contour line being about a mile offshore.

The village of Mondolfo stands on a hill, 472 feet (143^m9) high, about 6 miles north-westward of Senigallia and 2 miles inland. The mouths of Fiume Cesano and Fiume Metauro lie about 3 and 10 miles, respectively, north-westward of Senigallia. The former is crossed by a bridge with 14 arches and the latter by one with 20 arches; the mud brought down by these rivers often discolours the sea to a great distance; neither river is navigable. The village of Marotta, 2 miles north-westward of the mouth of Fiume Cesano, has a conspicuous tank a short distance south-eastward of it.

Chart 200, plan of Fano.

Fano.—The town of Fano, which contained 13,348 inhabitants, in 1939, is situated at the mouth of Canale delle Chiuse, the northern arm of Fiume Metauro. From seaward, it has the appearance of a large town. The principal industry is fishing; others are silk spinning and the manufacture of bricks. The town imports timber, coal and cement and exports fruit and vegetables. There are a civil hospital and a patent slip.

A white bathing establishment, about $1\frac{1}{2}$ cables westward of the harbour, and the bridge over Torrente Arzilla, about a cable farther westward, are conspicuous. Monte Giove, 732 feet (223^m1) high, stands about 2 miles south-westward of Fano; on the summit there is a convent with a remarkable campanile (Lat. $43^{\circ} 49' N.$, Long. $13^{\circ} 01' E.$). See view facing page 563.

Harbour.—The harbour is formed by the mouth of Canale delle Chiuse and consists of three basins. The sides of the canal and the basins are quayed, and vessels can lie alongside. The entrance to

Charts 200, 1440, 2158a.

To face page 565.

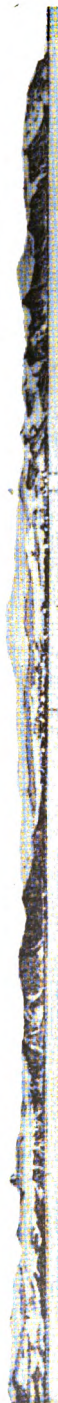


Monte San Vicino.

Porto Fano. Lt. Ho.
(destroyed 1944).

Monte Giove.

Monte San Marino.



Monte Ardizio.

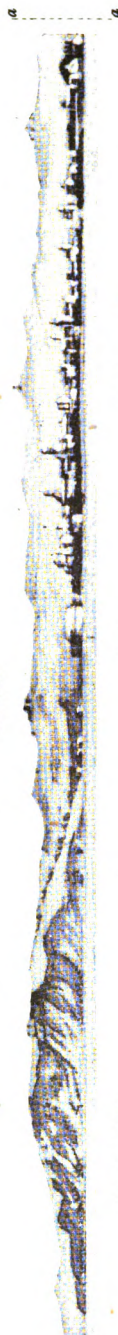
Porto Pesaro.

Fiorenzuola.

Pesaro Lt. Ho.
(destroyed 1944).
bearing 250° distant, 6½ miles.

View in 2 parts of coast from Porto Fano to Porto Pesaro.
(Original dated 1910.)

Novilara.

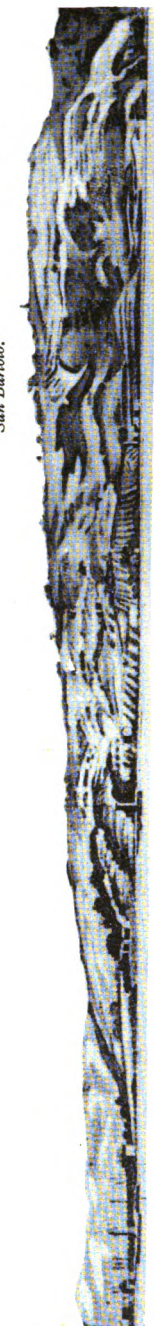


Monte Ardizio.

Castle.

Porto Pesaro.

San Bartolo.



Lt. Ho.
bearing 199° distant 7½ cables.
Harbour entrance.
(Lt. Ho. destroyed 1944.)

Fiume Foglia
entrance.

View in 2 parts of Porto Pesaro.
(Original dated 1910.)

Chart 200, plan of Fano.

the harbour, about 36 yards (32^m9) wide, lies between the heads of two moles of irregular shape extending offshore in a northerly direction; within, another mole extends from the eastern side of the canal parallel with the inner part of the western mole, forming an inner entrance to the canal. In 1944, there were breaches in the moles. 5

Steam vessels, drawing not more than 10 feet (3^m0), could, in 1939, lie alongside in the eastern basin.

Outside the entrance, shifting banks, with as little as 4 feet (1^m2) over them, are liable to form up to a distance of about a cable off the entrance and the harbour is subject to silting. A vessel should not enter without local knowledge. 10

Anchorage.—Large vessels can anchor in fine weather about 1½ miles offshore, in a depth of 6 or 7 fathoms (11^m0 or 12^m8), mud, good holding ground; small vessels anchor about 1½ cables northward of the entrance, in a depth of 2½ fathoms (4^m1). 15

Chart 200.

Coast.—Between Fano and Pesaro, 6½ miles north-westward, the coast rises and is dominated by Monte Giove (*Lat.* 43° 49' N., *Long.* 13° 01' E.), page 564, and Novilara, a hill 705 feet (214^m9) high, standing about 3½ miles west-north-westward of Fano and 2 miles inland; on the summit of the latter there is a dark-coloured village of the same name, with a conspicuous tower. The village of Ronco-sambaccio, with a church and campanile surrounded by trees, is situated, at an elevation of 486 feet (148^m1), about 1½ miles eastward of Novilara. Monte Ardizio, 463 feet (141^m1) high, dark and steep-sided, stands about a mile south-eastward of Pesaro. Seen from a distance, this mountain resembles Monte Conero; it is lower than the latter, but, like it, decreases in height north-westward; there are some white houses at its foot and it presents a steep, rocky slope to the sea. This stretch of coast is bordered by a bank, with depths of less than 5 fathoms (9^m1) over it, about a mile wide. See view facing this page. 25 30

Chart 200, with plan of Pesaro.

Pesaro.—This town, which contained 24,200 inhabitants, in 1939, is situated at the mouth of Fiume Foglia, between Monte Ardizio and Monte San Bartolo, 662 feet (201^m8) high, about 3 miles north-westward and a short distance inland. There are silk, porcelain and brick factories and foundries in the town. The principal imports are timber, coal, metal refuse and phosphates; and the exports are grain, flour, wine and olives. There is a small hospital and a railway station. There is usually a small stock of coal. Small quantities of fresh provisions can be obtained; water is laid on to the quays. Vessels can obtain electric current from the shore at 130 volts. There is a patent slip. 35 40 45

Fogs occur chiefly in December and March.

Conspicuous objects are a cupola in the centre of the town and a bathing establishment about 8 cables south-eastward of the eastern mole. See view facing this page.

Signal station.—A signal station is situated on Monte San Bartolo. It is not available for commercial purposes. 50

Dangers.—Within a distance of about 2½ cables off the entrance to the harbour there are several shallow banks of varying dimensions; the depths over these banks are subject to change and the banks are

Charts 1440, 2158a.

Chart 200, with plan of Pesaro.

liable to shift. Before entering, it is advisable to obtain information as to depths from the Port authority.

Shallow banks extend offshore on both sides of the harbour as far as the heads of the moles forming the entrance.

Light.—A light is exhibited, at an elevation of 16 feet (4^m9), on the head of the eastern mole (*Lat.* 43° 55' N., *Long.* 12° 55' E.).

Anchorage.—Vessels can anchor, in fine weather, about 1½ miles offshore, in depths of from 5½ to 6½ fathoms (10^m1 to 11^m9), mud, bad holding ground.

Harbour.—Buoys.—The entrance to the harbour of Pesaro is situated 2 cables eastward of the mouth of Fiume Foglia between two moles, about 44 yards (40^m2) apart, the eastern of which is the longer. In 1945, the eastern side of the channel was marked by a buoy painted red, about a cable within the entrance. The dredging of the channel was then in progress.

Within, on the western side, there are two basins; the northern and larger basin is quayed for half its length on its western side and has a depth of 12 feet (3^m7) in it. The southern basin is quayed on its western side and has a depth of 9 feet (2^m7) in it.

The harbour does not communicate with the river, but is separated from it at the head by a few yards only.

The harbour is subject to silt; northerly winds cause an inconvenient sea.

Chart 200.

Coast.—Off-lying buoy.—Between Pesaro and Rimini, 17 miles north-westward, the coast is intersected by many streams, of which Fiume Conca is the only one of any importance, fishing boats being able to ascend it at high water. For a distance of 6 miles north-westward of Pesaro, as far as the village of Gabicce, situated on a hill 472 feet (143^m9) high, the coast consists of cultivated hills. The following are conspicuous; the signal station on Monte San Bartolo; the small church of Santa Maria, elevated 512 feet (156^m1), about 1½ miles north-westward of Pesaro; and the village of Fiorenzuolo, with a church and campanile, elevated 581 feet (177^m1), about 2½ miles farther north-westward.

A can buoy is moored about 4½ miles northward of Pesaro and 4 miles offshore.

From a point about a mile eastward of Gabicce, the coast trends about 3 miles westward, forming a bight. Westward of Gabicce the hills become lower. The village of Cattolica, which contained 5,200 inhabitants, in 1939, lies a short distance inland about a mile westward of Gabicce; this village is connected to the railway system. The mouth of Fiume Conca, with Montefiore Conca standing about 7 miles south-westward, is situated about a mile farther west-north-westward.

Small vessels can anchor offshore between Gabicce and Fiume Conca, sheltered from southerly and westerly winds, but exposed to winds from south-east, through east, to north-west; south-westerly winds give rise to heavy squalls.

Approaching from north-eastward, Monte Gradara (*Lat.* 43° 56' N., *Long.* 12° 47' E.), 466 feet (142^m0) high, and Monte Luro, 948 feet (288^m9) high, situated about 1½ and 3½ miles, respectively, southward of Gabicce, are conspicuous; on the summit of the former there is a castle with a high tower; the latter is covered with grass and is

Charts 1440, 2158a.

To face page 566.

Fiorenzuola.

Gabice.

Gradara castle.

Monte Luro.



*Porto di Cattolica.
Li. Ho., bearing 156°, distant 18 miles.
(Li. Ho. destroyed 1944.)*



*New church,
Porto di
Cattolica
castle.*

Torre Conca.

*Railway bridge
over Fiume Conca.*

*View in 2 parts of coast from Fiorenzuola to the mouth of Fiume Conca.
(Original dated 1910.)*

Gabice.

Monte Carpegna.

Monte Copiolo.



Montefiore Conca.

*Porto di Cattolica,
bearing 249°, distant
4½ miles.*

Monte San Marino.

Monti Scorticata.

Bertinoro.



Monte Paradiso.

Porto Rimini.

*View in 2 parts of coast from abreast Montefiore Conca to Porto Rimini.
(Original dated 1910.)*

Chart 200.

surmounted by a church with a campanile in the form of a tower. See views facing page 566.

Porto di Cattolica is entered between two jetties extending a short distance northward from the mouth of Torrente Tavallo. Within, 5 there is a small dock for boats. It is only used by local craft.

Some rocks, with a depth of 6 feet (1^m8) over them, lie about 2½ cables offshore eastward of the axis of the entrance channel. The entrance is liable to become obstructed by sandbanks and the depths are, in any case, always less than 8 feet (2^m4). The harbour is subject to silt. 10

Light.—A light is exhibited, at an elevation of 25 feet (7^m6), on the head of the eastern jetty at Porto di Cattolica.

Prohibited area.—Navigation is prohibited in a area, indicated on the chart by pecked lines, from 5 to 12 miles off the stretch of coast just described. 15

Coast.—The village of Riccione, which had a population of 2,250, in 1939, is situated about 3½ miles north-westward of the mouth of Fiume Conca. This village consists of two parts, one, amongst trees a short distance inland and not easily seen, the other, consisting of numerous villas, on the beach. The village is connected to the railway 20 system.

Canale di Riccione, a small harbour protected by two short moles, is situated at the mouth of Rio Maranello, close north-westward of Riccione. There are depths of 2 feet (0^m6) in the harbour.

The mouth of Rio Marano lies about 1½ miles north-westward of 25 Canale di Riccione; near it there is a square reddish tower and north-westward of the bridge, which crosses Rio Marano, there are several conspicuous buildings.

Between Riccione and Rimini, about 5½ miles north-westward, a sandbank, with a depth of 5 feet (1^m5) over it, lies parallel with and 30 from one to 1½ cables off the coast; there are depths of 13 feet (4^m0) between it and the coast. Depths of less than 5 fathoms (9^m1) extend 2 miles offshore between these two places.

Lights.—A light is exhibited, at an elevation of 23 feet (7^m0), from a grey wooden tower, 21 feet (6^m4) in height, situated on the 35 eastern side of the entrance to Canale di Riccione, about 400 feet (121^m9) from the head of the mole.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column on a hut, 16 feet (4^m9) in height, on the head of the eastern mole at Canale di Riccione (*Lat.* 44° 00' N., *Long.* 12° 40' E.). 40

A light, for the use of aircraft, is occasionally exhibited, at an elevation of 98 feet (29^m9), at the airport situated about 2 miles north-westward of Canale di Riccione.

Chart 200, with plan of Rimini entrance.

PORTO RIMINI.—This harbour is formed by the mouth of 45 Fiume Marecchia. It is protected by two moles, about 55 yards (50^m3) apart, the sides of which are quayed. The moles extend offshore in a northerly direction, the western for a distance of about 1½ cables, and the eastern for about 3½ cables. Within these moles, the sides of the river are lined with quays up to the walls of the town. 50 About a mile within the entrance, and close below the town, the river is crossed by a railway bridge, and at the head of the harbour, by a road bridge. The deepest water, about 9 feet (2^m7), is generally found

Charts 1440, 2158a.

U

Chart 200, with plan of Rimini entrance.

towards the eastern side of the channel, but the depths are variable on account of the tendency to silt during floods, which come at times quite unexpectedly. The current during these floods is violent and the water sometimes rises 3 feet (0^m9) above the level of the quays. Six hours warning of these floods is always given by telegram.

Light.—Fog Signal.—A light is exhibited, at an elevation of 24 feet (7^m3), from a red iron column on a circular concrete hut, 18 feet (5^m5) in height, on the head of the eastern mole (*Lai.* 44° 05' N., *Long.* 12° 35' E.).

A fog signal is sounded from a red tower on the head of the eastern mole.

Anchorage.—There is anchorage, in a depth of 4½ fathoms (8^m7), with the head of the eastern mole, bearing about 194°, distant about one mile; or farther out, according to draught.

This anchorage is not recommended in strong winds which cause a heavy swell.

Chart 200.

Directions.—When approaching Rimini, in clear weather, vessels will sight Monti di Carpegna, 4,642 feet (1414^m9) high, with nearly flat peaks and wooded slopes, situated about 20 miles south-westward of the entrance; and southward of these, Monte Sasso Simone, which is lower, and has the appearance of being crowned by a wall. Monte San Marino, 2,438 feet (743^m1) high, next appears in sight, and is distinguished by its height and by the three towers on its summit. From the entrance, Monte San Marino is nearly in line with Monte di Carpegna. The town of Rimini is afterwards sighted. See view facing this page.

The head of the eastern mole, bearing about 194°, gives the direction of the harbour channel.

Chart 200, plan of Rimini.

Town.—Rimini stands at the foot of fertile hills on the south-eastern bank of Fiume Marecchia, which rises in the Apennines; its harbour was formerly celebrated. A marble bridge of five arches, each of 27 feet (8^m2) span, crosses the river at the head of the harbour, and a triumphal arch erected to Augustus still exists. It is a walled town and had a population of about 31,500 in 1939. The coast railway crosses the river below the town and then forms two branches, one turning inland and the other continuing along the coast to Cervia, about 15 miles north-westward.

Near the sea are fine gardens, numerous villas and a large bathing establishment, much frequented during the season. The tall chimney of a chemical manure factory on the western bank of the river is conspicuous.

Rimini (*Lat.* 44° 04' N., *Long.* 12° 35' E.) has flour and sulphur mills, a tobacco factory and railway workshops. The principal trade is in agricultural produce, fishing and bricks.

There is a civil hospital with about 150 beds, and a meteorological observatory in the town.

Communications.—There is a regular air service with Brindisi, Bari, Ancona and Venice.

Port facilities.—There are usually stocks of coal belonging to the railway and gasworks and also a private stock not exceeding 100 tons.

Fresh provisions, in small quantities, can be procured; the town

Charts 200, 1440, 2158a.



Convid prison.

*Porto Rimini lighthouse,
bearing 204°, distant 1½ miles.
(Lt. Ho. destroyed, 1944.)*



Colle del Paradiso.

*View in 2 parts of Porto Rimini.
(Original dated 1910.)*

Monte San Marino.

Monte Copiolo.

*Monti
Scorticata.*



San' Arcangelo.

Bardonchio.

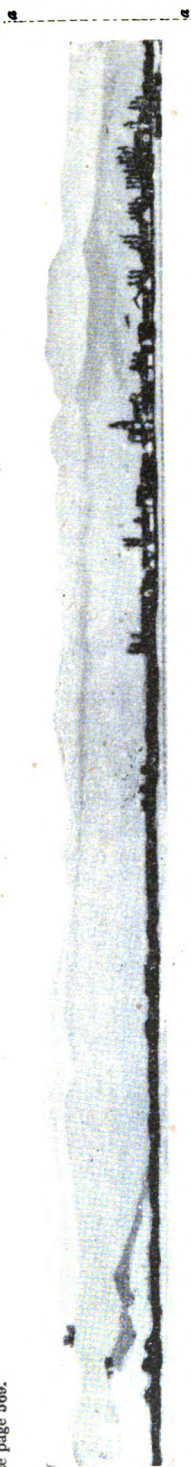


Cesena.

Bertinoro.

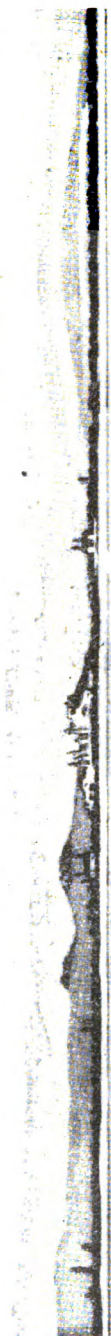
*Porto Cesenatico,
bearing 217°.*

*View in 2 parts of coast from Monti Scorticata to Porto Cesenatico.
(Original dated 1910.)*



*Lighthouse.
(Destroyed 1945.)
Harbour.*

*Steeple,
bearing 221° distant 2½ miles
Porto Cesenatico.*

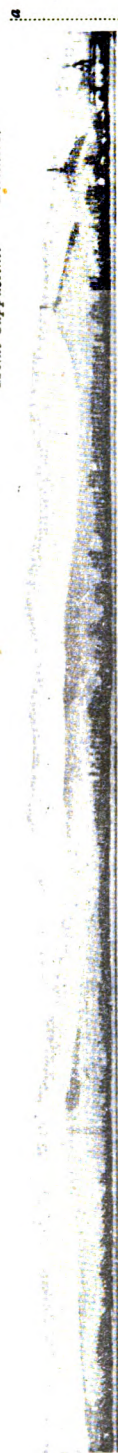


Cesena.

*Madonna
del Monte.*

*View in 2 parts of coast near Porto Cesenatico.
(Original dated 1910.)*

*Monastery,
Monte Cappuccini.
Bertinoro.*



Cesena.

*Cervia church,
bearing 235° distant 2½ m.*



*Li. Ho.
(Disused.)
Cervia.
Harbour.*

*View in 2 parts of coast from Cesena to Cervia.
(Original dated 1910.)*

Chart 200, plan of Rimini.

water, which is plentiful, is from artesian wells, and is slightly gaseous and ferruginous, but agreeable to the palate.

Small repairs to machinery can, in case of need, be made at the railway workshops. There is a patent slip capable of taking vessels up to 250 tons, *see* Appendix I. A 6-ton crane is situated on the eastern side of the harbour. Two tugs are available.

Chart 200.

COAST.—Between Rimini and Cesenatico, about 11 miles north-westward, the coast is low and sandy, and difficult of access, even for fishing boats, owing to the banks formed by the various streams which flow into the sea in this locality. Of these, Fiume Uso, ancient *Rubico*, famous for Caesar's passage at the head of his army, by which act he declared war against the Republic of Rome, the mouth of which is about 6 miles north-westward of Rimini, can be ascended by boats at high water when the sea is smooth.

Monte Sant'Arcangelo, 289 feet (88^m1) high, with a tower on each of its two peaks, standing about 5 miles westward of Rimini, is conspicuous from northward. The highest of the three peaks of Monti Scorticata, on which stands a conspicuous tower, is situated about 9 miles south-westward of Rimini. *See* view facing page 568.

The village of Viserba, which had a population of 1,470, in 1939, extends along the beach from 1½ to 3 miles north-westward of Rimini. A conspicuous water tank, with a chimney close northward of it, stands about a mile north-westward of Viserba. The village of Torre Pedrera lies amongst trees about half a mile farther north-westward.

The village of Bellaria, which had a population of 3,590, in 1939, is situated at the mouth of Fiume Uso. The village is connected to the railway system and small quantities of provisions can be obtained. The harbour of Bellaria is formed by two short moles about 100 feet (30^m5) apart, protected by a breakwater. The sides of the harbour are partly quayed. The depths at the entrance were about 3 feet (0^m9), at high water, in 1939; the harbour is liable to silt.

Vessels can anchor at a convenient distance off Bellaria, good holding ground.

Foce del Pisciatello, about 2 miles north-westward of Bellaria, is crossed by a conspicuous railway bridge with nine arches.

Air light.—An air light is exhibited at an elevation of 1,083 feet (330^m1), at Rocca delle Caminate, in lat. 40° 07' N., long. 11° 59' E., about 25 miles westward of Rimini, and may be visible from seaward in clear weather.

Cesenatico.—The harbour of Cesenatico is formed by two moles, about 38 yards (34^m7) apart, projecting north-eastward; it is difficult of access owing to banks at the entrance. The eastern mole is rather less than a cable long and projects a short distance beyond the western mole, which is about 2 cables long. The harbour can accommodate many coasting craft, and is the principal harbour on this part of the coast. In 1939, there were depths of only about 2 feet (0^m6), at low water, in the entrance (*Lat.* 44° 13' N., *Long.* 12° 25' E.).

Monti di Carpegna and Monte San Marino, page 568, are good landmarks for identifying this harbour; closer in, the municipal clock tower and the belfry of the cathedral, which has a red cupola, are conspicuous. *See* view facing this page.

Charts 200, 1440, 2158a.

Chart 200.

Light.—A light is exhibited, at an elevation of 16 feet (4^m9), on the head of the eastern mole.

Town.—Cesenatico is the port of the town of Cesena, situated about 8 miles west-south-westward, at the foot of the Apennines; the church of Madonna del Monte, at an elevation of 430 feet (131^m1), close south-eastward of Cesena, and the double hill of Bertinoro and Cappuccini, situated about 5 miles west-north-westward of the same town, serve to identify it. The village of Bertinoro, with a conspicuous tower, is situated on the hill of that name; Cappuccini is 1,076 feet (328^m0) high and crowned by a conspicuous convent.

Cesenatico is connected to the railway system. Fishing is the chief industry. The imports are timber, coal and bricks; the exports are preserved foods. Fresh provisions are obtainable. There is a small civil hospital. The population, in 1939, was 4,300.

Coast.—Lights.—Off-lying buoy.—The town of Cervia, which contained 2,920 inhabitants, in 1939, lies about 4 miles north-north-westward of Cesenatico. There are salt marshes in its vicinity and the principal industry is the production of salt. It is connected to the railway system and there is a small civil hospital.

The town lies near the south-eastern end of an extensive pine forest. Monti di Campegna, Monte San Marino and the double hill of Bertinoro and Cappuccini serve to identify its position. Closer in, the campanile in the town and a large yellow hotel nearer the sea are conspicuous; the campanile has a square base and a conical top. See views facing page 569.

The harbour of Cervia is formed by two short moles, which are partly quayed. There were depths of about 6 feet (1^m8), in 1939, in the channel between the two moles for a distance of about 1½ cables, within which the depths decreased rapidly. Close offshore there is a narrow bank with a depth of 5 feet (1^m5) over it.

Two lights are exhibited, each at an elevation of 26 feet (7^m9), from a post on a concrete hut, 23 feet (7^m0) in height, one on the head of the northern mole and the other on the head of the southern mole (Lat. 44° 16' N., Long. 12° 21' E.).

There is anchorage north-eastward of the town, up to a distance of 5 miles offshore, in a convenient depth, mud, good holding ground.

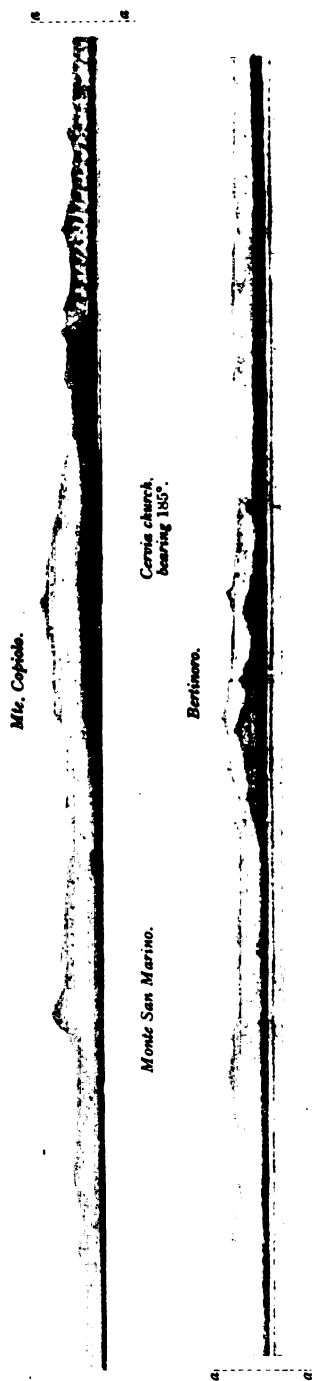
A can buoy is moored about 6½ miles north-eastward of Cervia.

The pine forest which begins a short distance northward of Cervia is about 18 miles long, with an average width of 2 miles, and extends almost as far as the mouth of Po di Primaro, situated about 21 miles northward of Cervia. The coast is low, sandy and intersected by marshes and streams. The high lands bordering the coast nearer Ancona disappear northward of Cervia, nor are the Apennines any longer seen a short distance inland. See views facing this page.

Between Cervia and Marina di Ravenna, 14 miles northward, access to the coast is obstructed by banks of mud and sand brought down by Fiume Savio which flows into the sea about 3 miles northward of Cervia, and by Fiumi Ronco and Montone which join and form Fiume Unito; the latter river is accessible to small fishing boats as far as the railway bridge, about 4½ miles inland, its mouth being situated about 5½ miles northward of Cervia. Depths of less than 5 fathoms (9^m1) extend from 3 to 3½ miles off this stretch of coast.

Charts 1440, 2158a.

To face page 670.



Torre Bevano.
View in 2 parts of coast from Cervia to Torre Bevano.
(Original dated 1910.)

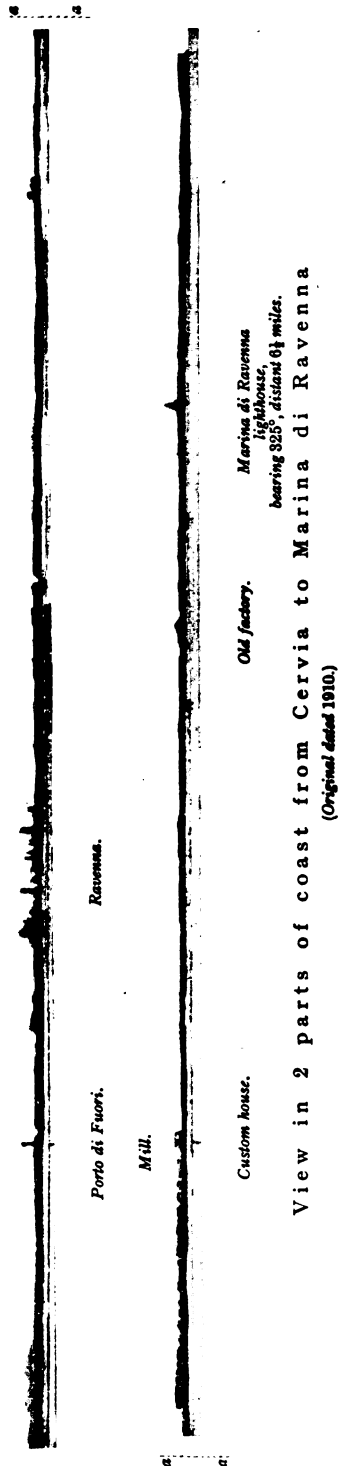


Chart 200.

The coast between the mouths of Fiume Savio and Fiume Unito forms a bight, at the head of which, midway between the two mouths, lies Bocca del Bevano, with a red-roofed customs house on its southern side; Torre del Bevano stands about a mile south-westward of this customs house (*Lat. 44° 22' N., Long. 12° 19' E.*). Coasting vessels anchor in this bight, northward of the mouth of Fiume Savio, the southern entrance point of which slightly protects them against southerly winds.

Chart 200, with plan of Marina di Ravenna.

Marina di Ravenna. — **Porto-canale.** — **Buoy.** — Marina di Ravenna, which had a population of 1,800, in 1939, is situated midway between Ancona and Venice, at the north-eastern end of Canale Candiano, which connects it with the town of Ravenna, 5 miles south-westward.

The entrance to Porto-canale di Marina di Ravenna is between two moles about 44 yards (40^m2) apart which project about 3½ cables off the coast in an east-north-easterly direction. A red conical buoy, moored about half a cable eastward of the head of the southern mole, marks the extremity of an obstruction extending from the molehead.

In 1943, there was a depth of about 16 feet (4^m9) in the channel from the entrance for a distance of about 8 cables, where the channel divides and leads into Canale Baiona, west-south-westward, and into the northern end of Canale Candiano, south-westward. The sides of the channel are quayed from the roots of the moles to a short distance within Canale Baiona. Vessels can secure to the quays in the sector between the lighthouse and Canale Baiona. The latter is navigable only for a short distance. See view facing page 570.

Caution.—With fresh winds and heavy seas from the eastern semi-circle, it is not prudent to attempt to enter Porto-canale di Marina di Ravenna.

Pilotage.—Authorised local pilots are usually available. Vessels requiring a pilot should wait half a mile from the entrance to the channel.

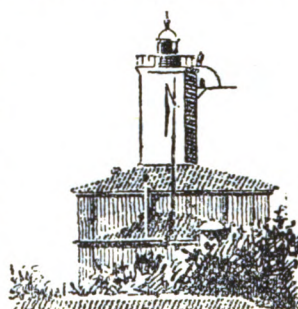
Lights.—**Fog signal.**—A light is exhibited, at an elevation of 105 feet (32^m0), from a white tower on a red dwelling, 100 feet (30^m5) in height, on the southern side of Porto-canale di Marina di Ravenna, about 2½ cables westward of the root of the southern mole (*Lat. 44° 29' N., Long. 12° 17' E.*).

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a black rectangular iron hut, 15 feet (4^m6) in height, near the head of the northern mole.

An air fog signal is sounded from the head of the southern mole.

Current signals.—At night, two red lights, exhibited from the main lighthouse, disposed vertically, indicate that the tidal stream is in-going; disposed horizontally, indicate that the tidal stream is out-going.

By day, the same information is conveyed by the display of balls in a similar manner.



Marina di Ravenna lighthouse.

Chart 200, with plan of Marina di Ravenna.

Canale Candiano.—This channel runs in a general south-westerly direction from the head of Porto-canale di Ravenna for a distance of about 5 miles, where it leads into Porto di Ravenna. The width on the surface of the channel is about 164 feet (50^m0) and, at the bottom, about 66 feet (20^m1). In 1943, the depth in mid-channel was about 16 feet (4^m9). The banks are quayed in places; the channel is liable to silt. About a mile north-eastward of Ravenna, on the north-western side of the channel, there is a small dock for the use of an oil tanker.

Porto di Ravenna.—The harbour of Ravenna consists of two basins, Darsena Nuova and Darsena Vecchia. The latter, 984 feet (299^m9) long in a north and south direction, and 82 feet (25^m0) wide, is situated at the south-western end of Canale Candiano and vessels drawing less than 10 feet (3^m0) could, in 1939, lie alongside. At its northern end, this basin leads into Darsena Nuova, which is triangular in shape, with a greatest length of 1,800 feet (549^m9) and a greatest width of 656 feet (200^m0); vessels drawing not more than 16 feet (4^m9) could, in 1939, lie alongside the quays of this basin. At its north-eastern end, Darsena Nuova leads into Canale Candiano. The quays of both basins are connected to the railway system.

Regulations.—There are special regulations for vessels navigating Porto-canale di Marina di Ravenna, Canale Candiano and Porto di Ravenna.

25 Chart 200.

RAVENNA.—This town, which contained 31,251 inhabitants, in 1939, originally stood near the coast but is now between 4 and 5 miles inland and on the border of the pine forest previously mentioned. The industries are agriculture, sulphur and sugar refining, the manufacture of bricks, cement and chemical manures. The imports are coal, fertilisers, grain, timber, stone and manure; the exports are agricultural produce, bricks and sugar.

There is a civil hospital and a military infirmary.

The country round is marshy.

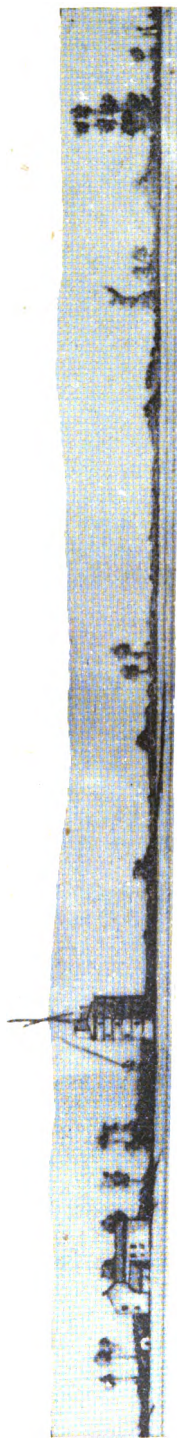
35 Ravenna is connected to the railway system. Fresh provisions are obtainable. Water is laid on to the quays.

See views facing page 570.

Directions.—On approaching the land near Marina di Ravenna from eastward the depths decrease regularly. Anywhere on this part of the coast, which is flat and only visible from a short distance, the double hill of Bertinoro and Cappuccini, page 570, about 16 miles southward of Ravenna, is first sighted, followed by the pine forest on the coast. The domes and towers of the churches of Ravenna can be seen amidst the surrounding trees from a distance of about 8 miles offshore; lastly are seen the houses of Marina di Ravenna and the main lighthouse, which stands alone. See view facing page 570.

COAST.—About 3½ miles northward of Marina di Ravenna is the entrance to the Reno drainage canal, which coincides with the old mouth of Fiume Lamone (*Lat. 44° 33' N., Long. 12° 17' E.*), now diverted. It is protected by two moles which project about three-quarters of a cable east-north-eastward. The depths between the moles are unstable, varying between 6 feet (1^m8) and 2 feet (0^m6).

Charts 1440, 2158a.



*Torre Primaro
on a westerly bearing.*

Fiume Po di Primaro.
(Original dated 1910.)

Oaks.

*Lighthouse,
bearing 200°.*



Saline.

Red tower.

*Entrance to
Porto Garibaldi.*

a. a.



Comacchio.

View in 2 parts of Porto Garibaldi and Comacchio.
(Original dated 1910.)

Chart 200.

Primaro, a village which had a population of 1,370, in 1939, lies about 6 miles northward of Marina di Ravenna; it can be identified by a conspicuous row of poplar trees and by Torre di Primaro (Old Semaphore) which is square and of a yellowish colour, and stands on the eastern bank of Fiume Po di Primaro, about $2\frac{1}{2}$ miles southward of the mouth of that river. 5

Fiume Po di Primaro can be ascended by small vessels, drawing not more than 3 feet (0^m9), as far as Sant'Alberto, on the southern bank, about 8 miles from its mouth. This river does not communicate with Fiume Po. The entrance to Fiume Po di Primaro is obstructed by shifting banks, with depths of less than 6 feet (1^m8) over them, which extend usually from $1\frac{1}{2}$ to $2\frac{1}{2}$ cables offshore. The 5-fathom (9^m1) contour line lies about 2 miles off this part of the coast. See view facing this page. 10 15

Between the mouth of Fiume Po di Primaro and Porto Bianco, about 9 miles northward, there is a bight. The coast is a strip of low land, with occasional groups of tall, slender trees, terminating in a series of small sand hills, which separate Laguna di Comacchio from the sea. This lagoon is fed by the waters of the sea, which enter Porto Garibaldi, about $5\frac{1}{2}$ miles northward of Torre di Primaro, and thence flow through Canale Pallotta; the lagoon has an extensive area, with an average depth of about one foot (0^m3), over a clay bottom. 20

The town of Comacchio, which had a population of 9,150, in 1939, is situated amidst salt marshes, on Canale Pallotta, about $2\frac{1}{2}$ miles from the coast, and is surrounded by canals. This town is connected to the railway system. 25

Porto Garibaldi.—This harbour is formed at the mouth of Canale Pallotta. The entrance is protected by two moles, each extending about $2\frac{1}{2}$ cables east-north-eastward offshore; three short breakwaters lying parallel with and a short distance off the coast protect the beach northward of the moles. The harbour has a navigable width of 79 feet (24^m1). The depths at the entrance are about 6 feet (1^m8); thence, to Albani bridge, towards the southern side of the channel, there are depths of over 8 feet (2^m4). 30 35

This harbour is difficult to enter owing to shallow banks on the southern side of the entrance. Sandbanks, which disappear with the out-going tidal stream, often form in mid-channel between the moles.

The quays have irregular projections which cover and uncover with the tide. Small craft, drawing about 4 feet (1^m2), can lie alongside the quays. The harbour is liable to silt. 40

A pilot is indispensable. A local pilot can be obtained who will take a vessel as far as Comacchio. Previous notice is necessary.

Two pointed campaniles and two conspicuous towers in Comacchio, about 3 miles north-westward, and Torre di Primaro are useful marks for making the entrance. See views facing this page. 45

Porto Garibaldi is connected to the railway system.

Lights.—A light is exhibited, at an elevation of 31 feet (9^m4), from a grey iron framework structure on a white concrete hut, 30 feet (9^m1) in height, near the root of the northern mole (*Lat.* $44^\circ 40' N.$, *Long.* $50^\circ 15' E.$). 50

A light is exhibited, at an elevation of 26 feet (7^m9), from an iron column on a black rectangular iron hut, 15 feet (4^m6) in height, near the head of the northern mole.

Charts 1440, 2158a.

Chart 200.

A light is exhibited, at an elevation of 25 feet (7^m6), from an iron column on a red rectangular concrete hut, 18 feet (5^m5) in height, near the head of the southern mole.

- 5 **Anchorage.**—Vessels anchor, in a depth of 5 fathoms (9^m1), about 2½ miles from the coast, half way between Porto Garibaldi and Porto di Volano (*Lat. 44° 48' N., Long. 12° 16' E.*), 8 miles northward. The anchorage is good with offshore winds but exposed to those between N.E. and south. This low coast should be approached with caution.
- 10 **Weather.**—The following are said to be local weather prognostics. When the land south-westward of Porto Garibaldi is covered with clouds, with a light north-easterly wind, that wind will freshen; on the other hand, if the land to the north-westward is clouded over, south-easterly or southerly winds will follow. The sky to the north-
- 15 eastward laden with thick white clouds, with a light south-easterly wind at Porto Garibaldi, indicates that a north-easterly wind is already blowing at Punta della Maestra.

Fog thinning rapidly indicates a decline of the Bora shortly, if the weather keeps dry, but is a prelude to the Scirocco if the clearing up is

20 followed by rain.

Chart 201.

- Coast.**—Porto Bianco, about 5½ miles northward of Porto Garibaldi, is another outlet of Laguna di Comacchio; completely obstructed during some months, it is opened artificially for the requirements of
- 25 the fishery. A conspicuous customs house with a red roof stands on the eastern bank of the channel, a short distance southward of the entrance, and the isolated campanile of Pomposa, on Fiume Po di Volano, 5 miles north-westward, is a good mark.

- FIUME PO AND DELTA.**—The delta of Fiume Po or so much
- 30 of it as protrudes beyond the general trend of the coastline, may be considered to begin 2 miles northward of Porto di Volano and extend northward to Porto Caleri, a direct distance of about 16 miles, but 30 miles by the coast. The soil brought down by the river has, in the course of ages, greatly changed the outline of the coast, and the
- 35 eastern extremity, near Punta della Maestra, is about 10 miles in advance of the natural coastline; this extension is still in progress and, in 1913, depths of less than 3 fathoms (5^m5) were found 4½ miles east-south-eastward of Punta della Maestra lighthouse, while about 3 miles eastward of the lighthouse extensive shoaling was reported in
- 40 1919. About 2 miles south-eastward of Po di Goro lighthouse and 2½ miles east-south-eastward of Punta della Maestra lighthouse, the depths shoal rapidly from 6 and 8 fathoms (11^m0 and 14^m6) to 1½ and 2½ fathoms (3^m0 to 5^m0). About 3 miles south-eastward of the latter lighthouse a depth of only 3½ feet (1^m0) is found. So rapid and
- 45 uncertain are the extensions that no vessel navigating these waters should approach the coast between the mouths of Fiumi Po delle Tolle and Po di Maestra nearer than 5 miles nor within a less depth than 16 or 17 fathoms (29^m3 or 31^m1). The general character of the land is low, flat and marshy.
- 50 The various mouths of Fiume Po, which may be considered to be eight in number, embrace an extent of about 26 miles of coast, including Fiume Po di Volano to the southward and Fiume Po di Levante to the northward.

Charts 200, 1440, 2158a.



*Pomposa
campanile.*

*Torre Volano,
bearing 282°.*



Gorino. Po di Goro lighthouse.

*View in 2 parts of Rada di Goro and Sacca dell'Abate.
(Original dated 1910.)*



*Mouth of Fiume Po di Goro.
(Original dated 1910.)*



Mouth, bearing 015°.

*Mouth of Fiume Po delle Tolle.
(Original dated 1910.)*

Chart 201.

The river has its source in the Grisons Alps at Monviso, and after flowing 280 miles eastward from Turin reaches the Adriatic, receiving in its course the waters of several tributaries.

From Piacenza to Papozze and Serravalle villages, 19 miles below Pontelagoscuro, the port of Ferrara, the river flows between embankments and is named Fiume Po Grande; below these villages the river is known as Po di Venezia and divides, Fiume Po di Goro branching off southward. About 16 miles below this, in the vicinity of Molo Farsetti (*Lat. 44° 57' N., Long. 12° 19' E.*), Fiume Po della Gnocca, or della Donzella, branches off southward, and, about a mile farther eastward, Fiume Po di Maestra branches off northward.

Below Molo Farsetti, the main branch is known as Fiume Po delle Tolle, which trends about 5 miles eastward to the village of Ca' Zuliani and then southward to its mouth. Fiume Po della Pila branches off eastward at Ca' Zuliani. There are numerous other branches in addition to those mentioned.

Fiume Po di Volano, page 574, is the southernmost branch of the river; next come Fiume Po di Goro and Fiume Po della Gnocca, flowing into the sea through projecting low land which separates Sacca di Goro, or dell'Abate, from Sacca degli Scardovari. Between the latter bay and Punta della Maestra, there are Fiume Po delle Tolle, Busa del Bastimento, and Fiume Po della Pila, which has a small entrance on each side near its mouth; they contain numerous sandbanks, and, as conspicuous and identifiable objects are scarce in this area, the navigation is difficult even for those with local knowledge. Northward of Punta della Maestra there are several small entrances in addition to the principal mouth of Fiume Po di Maestra; and, also, Fiume Po di Levante, the northernmost. See views facing this page.

The four practicable passages have only sufficient depth for small craft.

Porto di Volano.—Light-buoy.—Porto di Volano is the outlet of Fiume Po di Volano which flows into the sea on the western shore of Sacca di Goro. This branch of the river, after receiving the waters of Poatello and of various canals which unite under the walls of Ferrara, is called Fiume Po di Volano. Small coasting craft can proceed to Codigoro and Ferrara, about 28 miles inland.

A tower and a few houses indicate the entrance of Porto di Volano; also, a large forest of pine and oak trees, which, beginning at the tower, extends $4\frac{1}{2}$ miles northward. The entrance is round a tongue of sand which runs parallel with the coast and extends $1\frac{1}{2}$ miles north-eastward of the tower.

A light-buoy, exhibiting a *green flashing light every five seconds*, duration of flash *half a second*, is moored at the entrance to Porto di Volano.

Sacca di Goro.—This bay, also known as Sacca dell'Abate, is entered between Porto di Volano and the mouth of Fiume Po di Goro, about 6 miles eastward. Except for the channel which gives access to Fiume Po di Volano, the bay is almost completely occupied by a bank which dries, with above-water sandbanks along its southern side. The bay is usually frequented by fishing boats; there is a short quay near its head.

The village of Goro, which contained 2,694 inhabitants, in 1939, lies about a mile inland from the head of the bay, and the village of Gorino

Chart 201.

lies about the same distance inland from its north-eastern side. The campanile (*Lat.* 44° 50' N., *Long.* 12° 21' E.) in the middle of the latter village is conspicuous.

- 5 **Rada di Goro.—Anchorages.**—Rada di Goro, southward of Sacca di Goro, affords good shelter from all winds except those between south and east, with which the anchorage is dangerous. The best anchorages are with Po di Goro lighthouse bearing 041°, distant 3½ miles, in a depth of about 4½ fathoms (8^m7), or with the tower near
- 10 Porto di Volano in line with the campanile of the village of Pomposa, bearing 297°, and with the same lighthouse bearing 065°, in a depth of about 3 fathoms (5^m5). The bottom, mud and clay, affords good holding ground everywhere, and it is often difficult to weigh the anchor when the precaution of occasionally sighting it has not been taken.
- 15 See views facing page 575.

Fiume Po di Goro.—Light.—Fiume Po di Goro is that branch of the river which leaves the main stream about a mile westward of the village of Santa Maria in Punta, and flows into the sea at the south-eastern entrance point of Sacca di Goro, after a course of about 26 miles.

- 20 Between its mouth and its point of junction with Fiume Po Grande, are the villages of Gorino, Goro, Mesola, and the town of Ariano Polesine. At the entrance of Fiume Po di Goro there is generally a depth of about 6 feet (1^m8), but the banks and depths are constantly changing; it is impossible to navigate without a pilot. The channel is generally
- 25 marked by poles.

The 3-fathom (5^m5) contour line was reported, in 1939, to extend farther seaward than indicated on the chart.

A large building with a red roof is situated about half a mile eastward of Po di Goro lighthouse.

- 30 A light is exhibited, at an elevation of 66 feet (20^m1), from a white conical tower on a two-storey dwelling, 61 feet (18^m6) in height, situated on the south-western side of the mouth of Fiume Po di Goro, three-quarters of a mile within the entrance (*Lat.* 44° 48' N., *Long.* 12° 23' E.). See view on chart 201.

- 35 **Fiume Po della Gnocca.—Light.**—Fiume Po della Gnocca, also known as Po della Donzella, flows into the sea about 1½ miles north-eastward of the mouth of Fiume Po di Goro. Its mouth is generally preferred by boats proceeding to Venice by the inland channels, in order to avoid rounding Punta della Maestra and the navigation of
- 40 a difficult and, in the winter season, dangerous coast. The shoals off the mouth frequently shift their position, and a pilot is necessary.

- A light is exhibited, at an elevation of 23 feet (7^m0), from a framework pile structure, 24 feet (7^m3) in height, a short distance eastward of the mouth of Fiume Po della Gnocca, on the western side of the
- 45 entrance to Sacca degli Scardovari, at a distance of about 2½ miles east-north-eastward of Po di Goro lighthouse.

- Sacca degli Scardovari.—Anchorage.**—Sacca degli Scardovari, which is shallow, is entered between the mouth of Fiume Po di Gnocca and the eastern entrance point of the principal mouth of Fiume Po
- 50 delle Tolle, about 3 miles north-eastward. Access to this bay is barred by shallow banks which extend about a mile south-eastward of an imaginary line joining the entrance points. See view facing page 575.

There is good anchorage in northerly and westerly winds in a depth of about 5½ fathoms (10^m1), with Po di Goro lighthouse bearing 265°

Chart 201.

and Casa Papadopoli 330°. Casa Papadopoli is surmounted by a tower and is situated 5 miles northward of the lighthouse. As the water shoals suddenly and the shoals are rapidly extending near the mouths of Fiume Po delle Tolle, and from thence northward, care should be exercised in approaching. In case of necessity, vessels may anchor off any part of this coast; the holding ground is good.

Busa del Bastimento.—Light.—Busa del Bastimento, about 3 miles northward of the eastern entrance point of Sacca degli Scardovari, is the only navigable one of the many mouths of Fiume Po delle Tolle. A light is exhibited, at an elevation of 18 feet (5^m5), from a pile structure, 20 feet (6^m1) in height, on the northern side of the entrance to Busa del Bastimento.

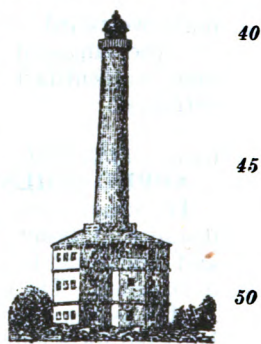
Punta della Maestra.—Fiume Po della Pila.—Punta della Maestra is at the eastern extremity of the delta of Fiume Po; it is very low, the land in its vicinity being marshy, and divided by streams into a vast number of islands which frequently change their form, especially after heavy winter rains, and, in the spring, at the melting of the snows. There are trees near it, close to the coast, which may be seen from a distance of 5 miles, and the white lighthouse (*Lat.* 44° 58' N., *Long.* 12° 29' E.) somewhat farther. The light-and-whistle-buoy, off the river entrance, should be given a good berth, as there are depths of less than 3 fathoms (5^m5) southward and south-eastward of its position. This depth is constantly growing out to the eastward along the front of the delta; the shallow bottom may be readily distinguished by day, in fine weather, by the discoloration of the water. A haze generally hangs over the coast, and it should be approached with great caution. Punta della Maestra is about 12 miles north-eastward of Po di Goro lighthouse; it is an ill-defined point, being the north-western extremity of the land on the northern side of Fiume Po della Pila entrance, and the lighthouse stands on the low shore northward of the entrance of Fiume Po della Pila. The easternmost mouth of the latter river has a depth of about 5 feet (1^m5) on the bar off the entrance; it is subject to change, and extensive shoaling in the vicinity was reported in 1919. It communicates with Fiume Po delle Tolle, in which there are depths of from 2½ to 4½ fathoms (4^m1 to 7^m8). A pilot is necessary.

Lights.—Light-buoy.—A light is exhibited, at an elevation of 148 feet (45^m1), from a white circular tower on a three-storey white dwelling, 138 feet (42^m1) in height, near Punta della Maestra, on the northern bank of Fiume Po della Pila, about 3 miles inside the outer edge of the bar.

A light is exhibited, at an elevation of 30 feet (9^m1), from a black iron framework tower, 28 feet (8^m5) in height, on the northern side of the entrance to Fiume Po della Pila, about 2½ miles eastward of Punta della Maestra lighthouse.

A light-and-whistle buoy, painted in black and white bands, and exhibiting a *flashing white light every five seconds*, duration of flash *half a second*, is moored about 4 miles eastward of Punta della Maestra lighthouse.

Fiume Po di Maestra.—The mouth of Fiume Po di Maestra lies



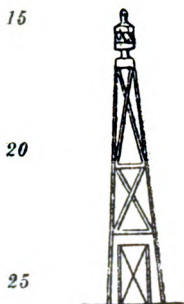
Punta della Maestra lighthouse.

Chart 201.

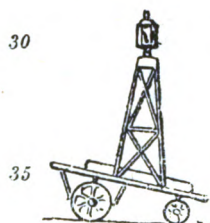
about 5 miles north-westward of Punta della Maestra, between are two small openings: Portopartiacque, $1\frac{1}{2}$ miles northward of the point, and Porto Palo, within a mile of Fiume Po di Maestra. Access to Fiume Po di Maestra is extremely difficult, as the sandbanks frequently shift and the current is very rapid.

The campanile of Contarina church is a good mark for this part of the coast; it is white, and is situated about 8 miles westward of the mouth of Fiume Po di Maestra. *See view facing this page.*

10 Porto Levante.—Leading lights.—Beacons.—Porto Levante, a village which had a population of 346, in 1939, is situated on the southern bank of Fiume Po di Levante, about 2 miles westward of the mouth of Fiume Po di Maestra and $1\frac{1}{2}$ miles inland. This village stands on low marshy land and its few houses are scattered.



Porto Levante rear light-structure.



Porto Levante front light-structure.

Fiume Po di Levante communicates with Fiume Po through Naviglio di Cavanella Po and the navigable channel of Po Brondolo and is also connected with Fiume Adige. The mouth of Fiume Po di Levante is encumbered with shifting sandbanks and only vessels of very shallow draught can enter.

Leading lights are established. The rear light is exhibited, at an elevation of 28 feet (8^m5), from a white framework structure, 25 feet (7^m5) in height, situated near the coast about a mile northward of Porto Levante (*Lat. 45° 03' N., Long. 12° 22' E.*).

The front light is exhibited from a white iron framework structure on a movable carriage, 6 feet (1^m8) in height, at a distance of from one to $1\frac{1}{2}$ cables east-north-eastward of the rear light; it is moved as necessary to meet the changes in the channel.

These lights, in line, lead to the entrance of the channel leading to Porto Levante.

A black and white post, 20 feet (6^m1) in height, surmounted by a board, stands on the northern side near the entrance of the channel.

A dolphin, surmounted by a staff and globe, stands on the southern side of the entrance to the channel.

Coast.—Porto Caleri, situated about 3 miles north-westward of Porto Levante, is another small passage leading into the canals in the interior; it is little frequented. This channel may be identified by a clump of trees on the northern bank of the entrance.

Charts 1483, 201.

45 APPROACHES TO VENICE.—Lagoons.—General remarks.

—The coast between Punta della Maestra and San Nicolo di Lido, a distance of about 30 miles following the coastline, is extremely low and intersected by marshes which render the neighbourhood unhealthy in summer. The largest of these marshes forms the lagoon of Venice.

50 As far as the entrance to Porto di Chioggia, the low sandy coast is bordered for a long distance offshore by shallow water with soundings gradually deepening towards the offing, and when northward of Fiume Po di Maestra, it may be approached with prudence. When northward

Charts 1440, 2158a.

*Fiume Po della
Pila.*

*Punta della Maestra
lighthouse, bearing
203°, distant 3 miles.*

Tolle church.

Restelli Ho.

View in 2 parts of coast from Punta della Maestra to Porto Levante.
(Original dated 1910.)

*Custom house,
Porto Levante.*

Charts 1483, 201.

of the delta of Fiume Po, and as far as San Nicolo di Lido, a depth of $5\frac{1}{2}$ fathoms (10m) will be found at an average distance of $1\frac{1}{2}$ miles offshore.

The coast is almost destitute of sea marks except the campaniles of the more important villages, such as Contarina, westward of the entrance of Fiume Po di Maestra; Madonna di Marina chapel northward of Porto di Brondolo; and northward of this, Sottomarina village and the town of Chioggia.

In the lagoon are about a hundred islands rising but little above the water; twenty-five of them are inhabited and the city of Venice is built upon the largest, though this island itself is said to consist of seventy-two islets connected by bridges. The lagoons form a basin, about 25 miles long from north to south, which is separated from the sea by a long strip of land forming a natural sea wall consolidated by artificial means and serving as a protection to the inner anchorages. In the vicinity of Venice this strip of land is named Il Lido.

There are three principal channels leading to Venice, Porto di Chioggia, which is accessible for vessels of moderate draught, Porto di Malamocco and Porto di Lido, both of which are accessible for vessels of deep draught; the last being the most frequented.

There are several smaller channels which can be used by small craft.

All these lagoon ports are either the mouths of existing rivers or of former river beds.

The navigation of the lagoons and of the channels between them is largely carried on by towing and tracking; pilots are generally employed and the winding passages are marked by piles. The flood stream enters rapidly and quickly spreads over the scattered pools and marshes; so that at high water one large sheet of water stretches from the mainland to the islands on the coast. Fogs are frequent in the winter months. See view on chart 201.

Pilotage.—Pilotage in the neighbourhood of Venice is divided into two sections, namely, sea pilotage and that of the inner channels. The first section commences from an imaginary line joining Piave Vecchia and Punta della Maestra lighthouses, and includes Porti di Lido, Malamocco and Spignon, and Chioggia (*Lat. $45^{\circ} 14' N.$, Long. $12^{\circ} 18' E.$*).

The second section comprises the channels which, from the interior of Porti di Malamocco and Lido, lead to the various anchorages off Venice and to the Royal Arsenal.

The first section is subdivided into two sectors, outer and inner; the outer is comprised between the imaginary line joining Piave Vecchia and Punta della Maestra lighthouses and that joining Piave Vecchia and Chioggia lighthouses; the inner sector embraces the remainder.

In the first section pilotage is optional both on arrival and departure; in the second section it is compulsory for all vessels, except for those not over 250 tons register, dredging vessels, and some others belonging to the naval service.

Chart 201.

Porto Fossone.—Porto Fossone is situated at the mouth of Fiume Adige, about 4 miles northward of Porto Caleri. This port is not accessible from the sea, owing to the sandbanks at the mouth of the river, over which there is a passage with a depth of only about 3 feet

Charts 1440, 2158a.

Chart 201.

(0^m9) and which is subject to continuous silting. The depths at a distance of about 6 cables off the entrance are from 5 to 6 fathoms (9^m1 to 11^m0); within the 5-fathom (9^m1) line, the depths decrease rapidly.

Fiume Adige rises in the Tirolese mountains, traverses the Tirol and passes by Trento and Verona. This river communicates with the lagoon channels, and is navigable by boats as far as Verona, those of very shallow draught can ascend a short distance above Trento.

- 10 **Porto di Brondolo.**—Porto di Brondolo, about 1½ miles northward of Porto Fossone, is at the mouth of Fiume Brenta, which rises in the mountains between Trento and Belluno and flows through a flat country from Bassano to the sea; it enters a navigable canal leading from Padua to Venice, and at Dolo trends southward and runs into
15 the sea at Porto di Brondolo. Fiume Brenta communicates by canals with Porto di Chioggia, Padua, Vicenza, Fiumi Adige, and Po. Its mouth, like that of Fiume Adige, is obstructed by the sandbanks which are common to both rivers. Forte di Brondolo, where several channels meet, is on the northern bank of Fiume Brenta, 1½ miles from its
20 mouth. When the river is swollen by rains, strong eddies are formed at the entrance. Fiume Brenta Vecchio enters the sea about a mile southward.

Chart 1483.

- PORTO DI CHIOGGIA.**—The coast between Porto di Brondolo
25 (*Lat. 45° 11' N., Long. 12° 19' E.*) and the entrance to Porto di Chioggia, 3 miles northward, is composed of sand dunes, and is named Lido di Sottomarina. The sea-walls protecting the town of Chioggia begin about 2 miles northward of Fiume Brenta. The village of Sottomarina stands on a narrow tongue of land by the sea-wall, about 4 cables
30 eastward of Chioggia.

- Porto di Chioggia is situated at the mouth of Canale Perognola, which is fed by the waters of the lagoons and several smaller channels, and reaches the sea between Forte San Felice, on the southern side, and Forte Caroman, situated at the southern end of Isola di Pellestrina,
35 about 4 cables northward, on the northern side. A bank, with depths of less than 2 fathoms (3^m7) over it, extends about half a mile south-westward from the southern end of Isola di Pellestrina, reducing the width of the channel to about 2 cables. *See* view facing this page.

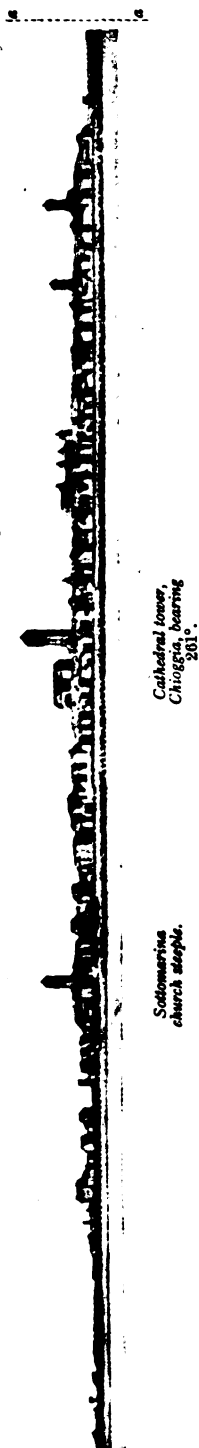
- Entrance channel.—Harbour.**—The entrance to Porto di Chioggia
40 is between two breakwaters, about 3 cables apart, which project eastward. The northern breakwater is about a mile long; at its root, an arm connects it with Forte Caroman, about 2 cables north-westward. The southern breakwater is 8½ cables long.

- Sunken rocks extend about a cable eastward from the heads of
45 both breakwaters. A spit, with a least depth of 15 feet (4^m6) over it, in 1939, extends 1½ cables southward from the head of the northern breakwater. A bank, with a least depth of 13 feet (4^m0) over it, extends about 2 cables northward from the southern breakwater. A heavy sea is caused by north-easterly, easterly or south-easterly
50 winds and the currents are irregular, which renders entrance difficult. It is always advisable to take a pilot.

The entrance channel leads into a deep hole close northward of Forte San Felice, where there was, in 1939, a depth, in one place of

Charts 201, 1440, 2158a.

To face page 180.



Li. Ho.



Porto Chioggia. Forte Caron.

View in 2 parts of Porto Chioggia before breakwaters were built.
(Original dated 1910.)

Chart 1483.

16 fathoms (29^m3); from thence a narrow channel leads close along the fort southward to the anchorage, which is well sheltered.

The harbour consists of two parts, an outer and an inner. The outer harbour is formed by the junction of Canale Perognola and Canale di Caroman, which is situated along the western side of Isola di Pellestrina, and is bounded northward by the southern end of the latter island and southward, by the sea-walls protecting Sottomarina. For anchorage, *see* below.

The inner harbour consists of Bacino di Vigo, a basin about 2 cables 10 long and 400 feet (121^m9) wide, situated between the northern end of the town of Chioggia and Diga delle Saline, a breakwater forming the northern side of the basin, together with two canals, one on each side of the town, and a basin, open northward, at the western end of Diga delle Saline; this latter basin has an opening in its south-eastern 15 corner. Vessels 295 feet (89^m9) long, drawing not more than 14 feet (4^m3), can enter Bacino di Vigo from its eastern end, the entrance channel being marked by posts; the other portions of the inner harbour are only suitable for small craft.

Lights. Fog signal.—A light is exhibited, at an elevation of 20 51 feet (15^m5), from a white octagonal tower on a red dwelling, 24 feet (7^m3) in height, situated in Forte San Felice (*Lat.* 45° 14' N., *Long.* 12° 17' E.).

A fog signal is sounded from Forte San Felice lighthouse.

A light is exhibited, at an elevation of 28 feet (8^m5), from a red iron column on a circular hut, 20 feet (6^m1) in height, on the head of the southern breakwater.

A light is exhibited, at an elevation of 28 feet (8^m5), from a black iron column on a circular hut, 20 feet (6^m1) in height, on the head of the northern breakwater.

A light is exhibited, at an elevation of 26 feet (7^m9), from a concrete structure with a circular tank, 20 feet (6^m1) in height, at the root of 35 the northern breakwater.

Two leading lights are exhibited: the front light, at an elevation of 23 feet (7^m0), from a framework structure on a square base on piles, 25 feet (7^m6) in height, situated about half a mile west-north-westward of Forte San Felice lighthouse; the rear light, at an elevation of 40 56 feet (17^m1), from a concrete framework tower on piles, 56 feet (17^m1) in height, situated about a mile westward of the front light. These lights in line, bearing 275°, lead through the entrance channel.

A light is exhibited, at an elevation of 26 feet (7^m9), from a red column on an iron hut, 22 feet (6^m7) in height, situated near the Health 45 office on the southern side of the entrance to Bacino di Vigo (*Lat.* 45° 13' N., *Long.* 12° 17' E.).

Buoy.—A black conical buoy, surmounted by a cone, is moored about 1½ cables westward of Forte San Felice and marks the eastern edge of the bank extending south-westward from the southern end of 50 Isola di Pellestrina, previously mentioned.

Radio station.—There is a radio station at Sottomarina, *see* page 46.

Anchorage.—Vessels, waiting to enter Porto di Chioggia, can



Charts 201, 1440, 2158a.

Chart 1483.

anchor, in a depth of 9 fathoms (16^m5), mud and sand, at a distance of about 2 miles offshore, with the belfry of the cathedral in Chioggia bearing 260°. This anchorage is only suitable in fine weather and
5 with offshore winds.

Within the harbour, vessels drawing up to 18 feet (5^m5) may anchor in the area south-westward of Forte San Felice, in depths of from 3½ to 7½ fathoms (5^m9 to 13^m7). Small vessels can anchor off Forte San Felice, securing their sterns to the quay or to the dolphins situated
10 there. There is good shelter, in all weather conditions, for small vessels whose draught permits, southward of Forte San Felice, moored to posts with their bows towards the fort.

The various channels which meet at Porto di Chioggia and communicate with Fiume Brenta, Porto di Malamocco, &c., are only avail-
15 able for small coasting vessels.

Aircraft regulations.—The arrival, departure and exercising of seaplanes is indicated by a red ball hoisted at the masthead of the Harbour office; at this signal, vessels should keep clear of an area in Canale Perognola, northward of Diga delle Saline, which is reserved
20 for seaplanes.

Directions.—A vessel bound for Porto di Chioggia should approach the low coast with caution. The high land in the vicinity of Padua is rarely visible, and the two objects first seen are usually the campanile of the village of Pellestrina, about 2 miles northward of the
25 entrance, and that of the cathedral in Chioggia, which is high and surmounted by a grey cupola. Southward of Porto di Chioggia, the campaniles of Porto di Brondolo and Madonna di Marina chapel will be seen, and on near approach, Forte San Felice, on the southern side, and Forte Caroman, on the northern side of the entrance.

30 Entering by day the leading lighthouses, and by night, the leading-lights, in line, bearing 275°, lead through the entrance channel over the southern end of the spit extending from the head of the northern breakwater and over the bank extending from the southern breakwater. A vessel, drawing more than 16 feet (4^m9) should pass the
35 breakwater heads in a position midway between the leading line and the head of the southern breakwater; thence borrow over towards the northern breakwater until past the western edge of the bank extending from the southern breakwater, when she may alter course to pass close westward of Forte San Felice towards the anchorage. To avoid
40 the bank extending south-westward from Isola di Pellestrina, a vessel must keep eastward of an imaginary line joining the light-structure on the root of the northern breakwater with that on the Health office.

On approaching the anchorage with an in-going tidal stream, a vessel should turn to stem the stream, keeping as close as possible to the
45 stakes on the eastern side; with an out-going tidal stream, a vessel should keep to the western side of the anchorage area and avoid being set over towards the eastern side by the tidal stream.

Chioggia.—This town (*Lat. 45° 13' N., Long. 12° 17' E.*) is built on an island and contained 23,577 inhabitants, in 1939; it is connected to
50 Lido di Brondolo by a bridge about 1½ cables long and to Sottomarina by a swing bridge. A canal, crossed by nine bridges, bisects the town. There are several ship-building yards and a considerable fishing industry. Chioggia is connected to the general railway system and there is regular steamer communication with Venice and other ports

Charts 201, 1440, 2158a.

Chart 1483.

in the vicinity. There is a small civil hospital. Small quantities of fresh provisions are obtainable.

There is an electric crane with a capacity of $2\frac{1}{2}$ tons and there are two small patent slips.

5

Lighters are available.

COAST.—Islands.—The coast between Porto di Chioggia and Porto di Lido, about $12\frac{1}{2}$ miles north-north-eastward, is composed of two low islands, Isola di Pellestrina and Isola di Malamocco, also called Isola di Lido, which protect the lagoons from the sea.

10

Eastward of this part of the coast is the off-lying bank called Cortellazzo bank, described later.

Isola di Pellestrina is a narrow sandy island lying between Porto di Chioggia and Porto di Malamocco; it is thickly populated and is cultivated.

15

The part near Porto di Chioggia presents nothing remarkable, but northward of the village of Pellestrina, the campanile of which, square with a red top, is one of the most conspicuous on this coast, buildings extend for about $1\frac{1}{2}$ miles, to a short distance northward of the village of Sant'Antonio. Buildings appear again at Porto Secca, $2\frac{1}{2}$ miles northward of Pellestrina and continue to the northern end of the island. The church of San Pietro in Volta, half a mile northward of Porto Secca, is conspicuous.

A high sea wall extends along the shore and protects the inner channels. The sandbanks along the shore of Isola di Pellestrina are changeable in form and extent, and the shallow parts become wider as Malamocco is approached; depths of less than 6 fathoms (11^m0) extend as much as $1\frac{1}{2}$ miles off the coast close southward of that port. A detached bank, with a depth of $5\frac{1}{2}$ fathoms (10^m5) over it, lies about 3 miles south-eastward of the northern extremity of Isola di Pellestrina (*Lat. $45^{\circ} 20' N.$, Long. $12^{\circ} 19' E.$*).

30

Isola di Malamocco, the north-eastern part of which is known as Il Lido, extends north-north-eastward $6\frac{1}{2}$ miles, in an almost direct line from Porto di Malamocco to Porto di Lido. The northern portion is highest, and from this part to the Pilot tower, near the south-western end, a sea wall protects the island from the heavy sea occasioned by southerly and easterly winds. A groyne for the protection of the beach extends 443 feet (135^m0) offshore in the vicinity of Hotel Excelsior, situated about $3\frac{1}{2}$ miles north-eastward of the Pilot tower. The campaniles of the villages of Malamocco and Poveglia, about $2\frac{1}{2}$ and $2\frac{1}{2}$ miles, respectively from the south-western end of the island, the latter being a short distance inland; the red building of the naval asylum; the large hotel facing the sea by the baths north-eastward of Forte Quattro Fontane; the campanile of San Nicolo, 128 feet (39^m0) high, at the north-eastern end; the towers of Venice behind; the forts at the ends of the island; the Pilot tower; and lighthouses are the most conspicuous objects. See view on chart 201. Isola di Malamocco, like Isola di Pellestrina, protects the lagoon channels against the violence of the sea.

35

40

45

Life-saving service.—There is a line-throwing apparatus at San Pietro in Volta.

50

Chart 201.

Cortellazzo bank.—This extensive bank of gravel and weed

Charts 201, 1440, 2158a.

Chart 201.

extends in an east-north-easterly and west-south-westerly direction, at a distance of from 9 to 12 miles from the coast, between Porto di Malamocco (*Lat. 45° 20' N., Long. 12° 19' E.*) and the town of Caorle, about 28 miles north-eastward. The bank is but a slight elevation of the bottom about a mile wide, extending 25 miles parallel with the coast and having depths of from 10 to 12 fathoms (18^m3 to 21^m9) over it; within it are depths of 10 to 13 fathoms (18^m3 to 23^m8), and outside it, of 13 to 15 fathoms (23^m8 to 27^m4), sand. It is reported to afford
10 some protection from the sea to the anchorages off the coast.

Light-vessel.—Fog signal.—A light is exhibited, at an elevation of 33 feet (10^m1), from a light-vessel, named LIDO, and painted in black and grey stripes, situated on Cortellazzo bank, about 16 miles eastward of the entrance to Porto di Malamocco.

15 A fog signal is sounded from the light vessel.

Outlying and off-lying buoys.—No. 23, a can buoy, painted black, with a black and white staff and globe topmark, is moored about 9 miles eastward of the entrance to Porto di Malamocco.

Chart 1483.

20 A white conical buoy is moored 3½ miles north-eastward of the head of the northern breakwater at Porto di Malamocco (*Lat. 45° 20' N., Long. 12° 21' E.*).

Anchorage.—Vessels can anchor anywhere off this coast in fine weather; there are, however, no secure anchorages, especially with the
25 Scirocco. When this wind is threatened, a vessel at anchor should proceed to sea and make for the Istrian coast.

The best anchorage is between the north-eastern breakwater of Porto di Lido and Porto di Piave Vecchia, 7 miles east-north-eastward, in a depth of about 8 fathoms (14^m6), good holding ground; a vessel
30 should be careful not to obstruct the entrance to Porto di Lido.

For a large vessel waiting to enter Porto di Malamocco, a convenient berth, in fine weather, is with the head of the northern breakwater bearing 295°, distant one mile, in a depth of 7 fathoms (12^m8). This anchorage is exposed to winds between north-east and south-east.

35 **PORTO DI MALAMOCCO.—Entrance channel.**—This harbour is one of the most important of the lagoon ports; it is the entrance to a passage for large vessels to Venice, about 7 miles distant, but vessels are recommended, when proceeding to that city, to enter, when possible, by Porto di Lido.

40 The entrance is between two whitish breakwaters, about 2½ cables apart, extending offshore in an east-south-easterly direction; the northern for a distance of about three-quarters of a mile from the south-eastern extremity of Isola di Malamocco and the southern for half a mile from the north-eastern extremity of Isola di Pellestrina.

45 Diga Palata delle Ceppe, about 1½ cables long, extends in a northerly direction from the southern side of the entrance, close westward of Forte San Pietro, and protects the harbour westward of it; there is a gap near the southern end of this mole to allow a free flow of water. Forte San Pietro is situated near the root of the southern breakwater
50 and Forte Rocchetta is situated on the northern side, at the south-western extremity of Isola di Malamocco. Forte Alberoni lies about 2 cables north-eastward of Forte Rocchetta.

A detached shoal, with a depth of 19 feet (5^m8) over it, lies in the

Charts 201, 1440, 2158a.

Chart 1483.

entrance channel, about $1\frac{1}{2}$ cables north-westward of the head of the southern breakwater. A vessel of deep draught should not enter without local knowledge.

The tidal streams between the moles often attain a rate of 4 knots and tend to scour the channel. 5

Within the harbour are the entrances to several channels; the entrance to Canale di San Pietro is close westward of the fort of that name; the entrance to Canale Spignon is about a mile west-north-westward of the same fort. These two channels lead to Chioggia. 10 The entrance to Canale Rocchetta, which leads to Venice, lies close westward of the fort of that name. The entrance to Canale Fisolo, a secondary channel, lies close westward of that of Canale Rocchetta.

Pilots.—A vessel requiring the services of a pilot, should make previous application to the Pilot station of San Nicolo di Lido.

Lights. — Leading lights. — Fog signal.—Rocchetta light is exhibited, at an elevation of 82 feet (25^m0), from a white circular tower on a dwelling, 76 feet (23^m2) in height, situated on the sea wall on the



Rocchetta lighthouse.

northern side at the western end of the entrance channel (*Lat. $45^{\circ} 20' N.$, Long. $12^{\circ} 19' E.$*).

A light is exhibited, at an elevation of 49 feet (14^m9), from a conical masonry tower and red brick dwelling, 43 feet (13^m1) in height, situated on the southern side of the entrance to Canale Spignon. 25

Canale Spignon and Rocchetta lighthouses, in line, bearing 287° , lead through the entrance channel. 30

A light is exhibited, at an elevation of 41 feet (12^m5), from a white octagonal building, 34 feet (10^m4) in height, on the head of the northern breakwater.



Canale Spignon lighthouse.

An air fog signal is sounded from this lighthouse.

A light is exhibited, at an elevation of 52 feet (15^m8), from a square concrete tower, 46 feet (14^m0) in height, on the head of the southern breakwater.

A light is exhibited, at an elevation of 36 feet (11^m0), from a red iron framework structure on a concrete base, 34 feet (10^m4) in height, on the head of Diga Palata delle Ceppe.

Signal station.—The signal and telegraph station consists of an isolated square building surmounted by a tower, 80 feet (24^m4) high, and is called the Pilot tower. It is situated at Alberoni, about 9 cables north-eastward of Rocchetta lighthouse at the southern end of Isola di Malamocco, and is a remarkable object from seaward, being painted in black and white bands,



Northern breakwater lighthouse.



Southern breakwater lighthouse.

Charts 201, 1440, 2158a

Chart 1483.

and in this respect differing from the uniform Italian system. See page 46. This station will transmit, by telegraph, messages received from ships.

- 5 **Quarantine station.**—The Quarantine station is situated in the channel westward of Poveglia, page 583.

Harbour.—Danger.—Buoys and beacons.—The harbour of Porto di Malamocco is situated at the outlets of Canali Rocchetta, Fisolo and Spignon, already mentioned.

- 10 A dangerous area lies off Rocchetta lighthouse, the southern limit of which is marked by a dan buoy. A vessel entering should pass southward of this buoy.

- San Pietro bastion is situated on the southern side of the harbour, about 4 cables westward of the root of Diga Palata delle Ceppe; two
15 beacons stand about a cable westward of this bastion and two other beacons stand on the north-western side of the entrance to Canale Rocchetta, about 8 cables farther northward, these beacons are diamond-shaped, mounted on masts and painted red and white in opposite quarters. The four beacons, in line, bearing 009° and 189°,
20 lead towards the entrance of Canale Rocchetta.

Two groups, each of three beacons, stand about half a mile west-north-westward of San Pietro bastion. The centre beacon of each group, in line, bearing 226°, leads towards the centre of the entrance of Canale Rocchetta.

- 25 Five can buoys are moored southward of Rocchetta lighthouse (*Lat. 45° 20' N., Long. 12° 19' E.*); the central buoy is used by vessels for adjusting compasses.

- Anchorage.—Berths.**—There are three anchorages in Porto di Malamocco; one is south-south-westward of Rocchetta lighthouse,
30 in depths of from 5 to 5½ fathoms (9^m1 to 10^m1), another is at the entrance to Canale Fisolo, about 2½ cables eastward of Canale Spignon light-house, in similar depths, and the third anchorage is off Alberoni.

- Vessels of shallow draught can secure alongside the wharves on the
35 western side of Isola di Malamocco, a short distance within the entrance to Canale Rocchetta.

Prohibited anchorage.—Anchorage is prohibited between the breakwaters in an area extending northward of an imaginary line joining the head of the southern breakwater with Forte San Pietro.

- 40 **Directions.**—Making Porto di Malamocco in hazy weather the entrance is difficult to identify as the lighthouses are then not easy to distinguish. In clear weather, by day, the buildings of Venice may be seen. The most conspicuous object northward of Porto di Malamocco is the Pilot tower, *see* Signal station, page 585. South-
45 ward are the churches of San Pietro and Alberoni with short belfries and the campaniles at Pellestrina and Chioggia.

- On nearer approach, the tall campaniles of Malamocco, 108 feet (32^m9) high, and Poveglia, 124 feet (37^m8) high, show up to the northward, and then gradually the entrance with the lighthouses and the
50 large low forts of San Pietro and Alberoni.

A vessel should enter between the breakwaters with Canale Spignon and Rocchetta lighthouses in line, bearing 287°, which leads northward of the 3½ fathom (5^m9) shoal, until Diga Palata delle Ceppe lighthouse bears 238°; then keep in mid-channel. When within Diga Palata

Charts 201, 1440, 2158a.

Chart 1483.

delle Ceppe (*Lat. 45° 20' N., Long. 12° 19' E.*) she should steer for the anchorage.

The time of high water and of the departure of the fishing fleet should be considered in entering, especially if proceeding to Venice. It is not prudent for a vessel drawing more than 18 feet (5^m5), to enter without a pilot.

At night.—The lights are available for entering, substituting light for lighthouse in the preceding directions.

Caution.—A vessel entering Porto di Malamocco with a strong north-easterly wind which has been blowing for some time should get well to the northward, and bring the head of the southern breakwater to bear about 250°, steer in on this line, going slow until the lighthouse on the head of the northern breakwater is abeam, when speed should be increased and the vessel headed up for the entrance. If a vessel attempts to pass close to the head of the northern breakwater on the course for the entrance channel, her fore part will be under the lee of the breakwater while her quarter is exposed to wind, sea and current, and if the foregoing precautions are not taken there is great danger of her head being thrown round on to the northern breakwater.

Tidal streams.—The tidal stream enters the lagoon through both Porto di Malamocco and Porto di Lido, meeting near Isola di Poveglia. Their strength is very variable; in Porto di Malamocco the tidal stream often attains a rate of 4 knots and in Porto di Lido, sometimes a rate of 3 knots.

The tidal streams off Forte San Pietro are very strong; the ebb stream running southward, from Canale Rocchetta meeting that running northward from Canale San Pietro and forming strong eddies at the end of Diga Palata delle Ceppe. Great caution is necessary when passing this point, as there is a strong set towards the northern side of the channel.

Communications.—Steamers plying four times a day between Porto di Chioggia and Venice call at Alberoni and Porto di Malamocco.

Fuel and supplies.—Large stocks of coal and fuel oil are kept at Venice.

A small quantity of fresh provisions can be obtained at Malamocco, but generally supplies must be procured from Venice.

Charts 1442, 1483.

Channels to Venice.—For the route through Canali Rocchetta, Malamocco, San Spirito and Orfano, a pilot should always be employed.

Entering Canale Rocchetta, the beacons on either the northern or southern shore, previously mentioned, in line, bearing 009° and 189°, respectively, lead westward of the shallow bank extending from the south-western extremity of Isola di Malamocco, and the two beacons farther westward, previously mentioned, in line astern, bearing 226°, lead to the centre of the entrance. The set of the tidal stream should be carefully watched when turning into this channel. Canali Rocchetta, Malamocco, San Spirito and Orfano are marked by clusters of piles, which support the banks.

After turning into Canale Rocchetta, the navigation of a vessel up to 350 feet (106^m7) in length, is not considered difficult. The least depth in the fairway of these channels was, in 1945, 22 feet (6^m7), in the northern half of Canale San Spirito. It is in this channel that the

Charts 201, 1440, 2158a.

Charts 1442, 1483.

tidal streams of two canal systems meet and separate, and it is therefore subject to silt.

Vessels cannot pass one another and caution is required when passing the openings of any of the smaller channels, especially during spring tides. The deep water channel is not very broad and the best water is towards the eastern side. The narrowest part of the channel is off San Clemente about $1\frac{3}{4}$ miles northward of Poveglia, where it would be dangerous for steam boats and other small craft to pass or overtake a large vessel, since the water becomes piled up against the ship's sides and rushes with great force along them and towards the banks.

Owing to the very strong currents at spring tides vessels of very deep draught are preferably navigated at neap tides, there being only a difference of about $1\frac{1}{2}$ feet (0^m5). They should also go up these channels at half-tide, if practicable, so that in case of taking the ground it will not be difficult to get off with the rise of tide. In the minor channels only one side is marked by stakes; there is always a stake to mark the junction of two channels. The channels must be navigated at slow speed, and great attention paid to boats and lighters.

20 Chart 1442.

PORTO DI LIDO.—Entrance channel.—Porto di Lido is entered between the north-eastern extremity of Isola di Malamocco and Punta Sabbioni, about $1\frac{1}{4}$ miles eastward, and is formed by the seaward end of Canale di San Nicolo, the last reach of Canale di San Marco; the latter channel leads north-westward towards Venice. The entrances of Canali di Treporti, di San Erasmo and dei Marani lie on the north-eastern, northern and north-western sides, respectively, of Porto di Lido.

The entrance channel, which is the most frequently used by vessels proceeding to Venice, lies between two breakwaters, the north-eastern of which extends from the shore at Punta Sabbioni in a south-easterly direction for half a mile. The south-western breakwater extends about $1\frac{3}{4}$ miles in a general south-easterly direction from the north-eastern end of Forte San Nicolo (*Lat. 45° 26' N., Long. 12° 24' E.*), situated at the north-eastern end of Il Lido, page 579. The width of the entrance channel, between the breakwaters, is about $4\frac{1}{2}$ cables. See view of coast on chart 201.

Vessels drawing 29 feet (8^m8), and not longer than 492 feet (150^m0), can proceed through the channel leading to Porto di Lido. The fairway of the channel is narrow and, at one place, is less than a cable off the south-western breakwater. Caution is necessary when approaching the entrance from seaward and a vessel is recommended to employ a pilot.

H.M.S. *London*, 630 feet (192^m0) long and drawing 21 feet (6^m4), passed through this channel, in 1934.

Danger.—A short distance south-westward of the head of the south-western breakwater, a shallow spit extends half a mile south-south-eastward from the general line of the edge of the shore bank; off this spit, a detached bank, with a least depth of 17 feet (5^m2) over it, lies about 8 cables southward of the head of the south-western breakwater.

Wrecks.—A number of wrecks, indicated on the charts, existed, in 1945, at a distance of about three-quarters of a mile north-westward of the entrance to the channel.

Charts 1483, 201, 1440, 2158a.

Chart 1442.

Lights.—Fog signals.—Two leading lights are exhibited: the rear light is exhibited, at an elevation of 115 feet (35^m0), from a white circular stone tower with black bands, situated on Isola di Murano, about 2 miles north-westward of the north-eastern extremity of Forte San Nicolo; the front light is exhibited, at an elevation of 55 feet (16^m8), from a white iron framework tower with black bands, on a concrete base, situated on the northern side of the channel, about 3½ cables north-north-westward of the north-eastern extremity of Forte San Nicolo, and 1½ miles south-eastward of the rear light. These lights in line, bearing 301°, lead through the entrance channel.

Two lights are exhibited, one at an elevation of 85 feet (25^m9), and the other at an elevation of 48 feet (14^m6), from a pagoda-like structure with two balconies, painted in black and white chequers, 82 feet (25^m0) in height, on the head of the north-eastern breakwater. These two lights were unlit, in 1945.

A nauphone is sounded at the light-structure on the head of the north-eastern breakwater.

A light is exhibited, at an elevation of 48 feet (14^m6), from a black octagonal tower with white stripes, 46 feet (14^m0) in height, on the head of the south-western breakwater (*Lat.* 45° 25' N., *Long.* 12° 26' E.). This light was unlit in 1945.

A light is exhibited, at an elevation of 11 feet (3^m4), from a concrete framework structure, situated close to the south-western breakwater, half way along it. This light was unlit in 1945.

An air fog signal is sounded from the light-structure half way along the south-western breakwater.

A light is exhibited, at an elevation of 20 feet (6^m1), from a concrete pile structure, 25 feet (7^m6) in height, on the southern side of the channel, about 1½ cables northward of the north-eastern extremity of Forte San Nicolo. A fog signal is sounded from this light-structure.

A light is exhibited, at an elevation of 10 feet (3^m0), from a concrete pile structure, 10 feet (3^m0) in height, situated on the southern side of the channel, about 2½ cables westward of the last mentioned light-structure. A fog signal is sounded from this light-structure.

Two lights are exhibited on the northern side of the channel; one from the southern angle of the front leading light-tower; and the other, at an elevation of 10 feet (3^m0), from a concrete pile structure, 10 feet (3^m0) in height, situated about 2½ cables west-south-westward of that tower.

Lights are occasionally exhibited for the use of aircraft; two from the north-eastern extremity of Forte San Nicolo; and another about a cable east-south-eastward of San Nicolo campanile, situated about half a mile south-westward.

Chart 201.

Buoys.—Beacons.—A pillar light-buoy, exhibiting a *white flashing* light every three seconds, is moored about 4½ miles east-south-eastward



Porto di Lido. Rear leading light-tower.



Porto di Lido. Front leading light-tower.

Chart 201.

of the head of the north-eastern breakwater. Pilots will embark at this light-buoy, weather permitting ; otherwise close to the entrance of Porto di Lido. A vessel should normally pass close north-eastward
5 of the light-buoy.

A white conical buoy is moored about $3\frac{1}{2}$ miles south-eastward of the head of the north-eastern breakwater.

Chart 1442.

A light-buoy, painted in red and white stripes, and exhibiting a *red*
10 *flashing* light, is moored about 9 cables east-south-eastward of the head of the south-western breakwater.

A can buoy, painted in red and white chequers, is moored on the south-western side of the channel, about $1\frac{1}{2}$ cables north-north-westward of the head of the south-western breakwater.

15 A conical buoy, painted in black and white chequers, is moored, on the north-eastern side of the channel, about 5 cables west-north-westward of the head of the north-eastern breakwater.

A green can light-buoy, exhibiting a *red fixed* light, is moored about three-quarters of a cable north-eastward of the light-structure situated
20 half-way along the south-western breakwater. Two can buoys are moored at distances of one and $1\frac{1}{2}$ cables, respectively, farther north-eastward.

A red light-buoy, surmounted by a red cone and exhibiting a *red flashing* light *every two seconds*, duration of flash *half a second*, is
25 moored on the south-western side of the channel, about 7 cables south-eastward of the front leading light-tower. A vessel entering should pass north-eastward of this light-buoy.

A black light-buoy, surmounted by a black cone and exhibiting a *green flashing* light *every two seconds*, duration of flash *half a second*, is
30 moored on the north-eastern side of the channel, opposite the last mentioned light-buoy. A vessel entering should pass south-westward of this light-buoy.

A conical buoy, painted in black and white bands, is moored about a mile eastward of the north-eastern extremity of Forte San Nicolo.
35 This buoy marks the south-eastern end of the sand-bank between the entrance to Canale di Treporti and that of Canale di San Erasmo ; a pile beacon stands on this sand-bank, about 7 cables east-north-eastward of the north-eastern extremity of Forte San Nicolo.

A framework beacon, painted in black and white bands, stands close
40 north-eastward of the leading line, about $3\frac{1}{2}$ cables north-westward of the front leading light-tower (*Lat. 45° 26' N., Long. 12° 23' E.*).

Two conical buoys, about $1\frac{1}{2}$ cables apart, the north-eastern of which is surmounted by a black cone and the south-western having a red topmark, are moored one on each side of the entrance to Canale dei
45 Marani.

A light-buoy, surmounted by a black cone and exhibiting a *green flashing* light showing a *short flash every three seconds*, is moored on the north-eastern side of Canale dei Marani, about half a mile west-north-westward of San Nicolo campanile. This light-buoy marks the south-
50 western edge of a shallow bank extending about a cable from Isola La Certosa.

A light-buoy, surmounted by a black cone and exhibiting a *green flashing* light *every four seconds*, duration of flash *one second*, is moored about 3 cables west-south-westward of San Nicolo campanile. This

Charts 1483, 201, 1440, 2158a.

Chart 1442.

light-buoy marks the eastern edge of a bank extending from Santa Elena, the south-easternmost suburb of Venice.

A light-buoy, surmounted by a black cone and exhibiting a *green flashing light every two seconds*, duration of flash *half a second*, is moored about $5\frac{1}{2}$ cables south-westward of San Nicolo campanile. This light-buoy marks the south-eastern edge of the bank just mentioned.

Signal station.—A signal station consisting of a rectangular building, surmounted by a square tower, painted in black and white chequers, is situated on the north-eastern extremity of Forte San Nicolo di Lido. The signal mast is outside and westward of the building (*Lat. $45^{\circ} 26' N.$, Long. $12^{\circ} 23' E.$*).

This station will transmit, by telegraph, messages received from ships.

Storm signals are displayed, *see page 43*.

Tidal streams.—The rate of the tidal streams in Porto di Lido is very variable and at times is as much as 3 knots. A strong south-easterly wind during springs causes an extraordinary rise, which sometimes overflows the quays of the city.

See tidal streams at Porto di Malamocco, page 587.

Chart 1483.

Anchorage.—Prohibited anchorages.—For a vessel waiting to enter Porto di Lido, a good anchorage, in calm weather, is with Burano campanile (chart 201) in line with Forte Treporti, bearing about 334° , and San Marco campanile in line with the light-tower on the head of the south-western breakwater, bearing about 285° , in a depth of about 8 fathoms (14^m6).

Forte Treporti is situated about 2 miles northward of the head of the north-eastern breakwater and Burano campanile about 2 miles farther north-north-westward.

Chart 1442.

Small vessels can anchor in the entrance to Canale di Treporti.

Anchorage is prohibited in an area between the breakwaters for a distance of about 8 cables within the entrance.

Anchorage is prohibited in an area, indicated on the chart, between Il Lido and La Certosa, about $3\frac{1}{2}$ cables westward. This area is reserved for seaplanes.

There are several mooring buoys southward of the area reserved for seaplanes.

Regulations concerning aircraft.—The arrival, departure and exercising of seaplanes is indicated by the display of a red ball at Forte Sant'Andrea, situated 4 cables northward of San Nicolo campanile, and by the sounding of a siren on the corner of Castello di Sant'Andrea. During the time the red ball is displayed, small craft must keep clear of the area reserved for seaplanes, previously mentioned.

Directions.—A vessel is recommended to approach the entrance to Porto di Lido from a northerly direction. Before entering, she should pass north-eastward of the light-buoy off the entrance and steer in with the two leading light-towers in line, bearing 301° ; a vessel of deep draught should be on the axis of the channel before



San Nicolo di Lido signal station.

Chart 1442.

arriving at the buoy. Care must be taken not to mistake the framework beacon, standing close north-eastward of the leading line and about $3\frac{1}{2}$ cables north-westward of the front leading light-tower, for
 5 the rear leading light-tower.

When the signal station on Forte San Nicolo is abeam, bearing about 211° , a vessel may alter course as necessary to pass between the wharves, one extending from Forte Sant'Andrea and the other from Il Lido, about $1\frac{1}{2}$ cables eastward.

- 10 **Dredgers.**—When dredging is in progress the side on which there is a clear passage is indicated, *by day*, by the display of two balls, disposed vertically; *at night*, by two *white* lights, disposed vertically.

The side which is not clear is indicated, *by day*, by one ball; *at night* by a *white* light.

- 15 *Charts 1442, 1483, 201.*

Porto Treporti.—This port is formed by Canale di Treporti, which trends $2\frac{1}{2}$ miles north-eastward towards the channels and lagoons at its head, and leads to Burano, page 591, and from thence communicates by canals with Caorle (*Lat. $45^\circ 36' N.$, Long. $12^\circ 53' E.$*), about 21 miles
 20 east-north-eastward, with Venice and other places. The entrance, about 3 cables wide, is between Punta Sabbioni and the bank extending south-eastward from Isola Sant'Erasmo. The southern extremity of the latter island lies about 7 cables northward of the signal station at Forte San Nicolo. A black spherical buoy and pile beacon, previously
 25 described, are situated on the western side of the entrance. The depths in the channel are irregular, but it is accessible for vessels drawing not more than 10 feet (3^m0).

Chart 1442.

Canale di Sant'Erasmo.—The entrance to this channel, which is
 30 narrow between the banks on either side, is situated about 3 cables north-north-eastward of the signal station at Forte San Nicolo. The channel trends about a mile north-north-westward, where it leads into Canale Carbonera. There were depths of about 5 feet (1^m5), in 1939, over the bar at the entrance; northward of the bar there were depths
 35 of about 13 feet (4^m0).

Canale dei Marani.—The entrance to Canale dei Marani is situated about 4 cables westward of San Nicolo campanile. This channel leads to the Arsenal, page 594, and to the town of Murano, which contained 6,368 inhabitants, in 1939, and which is situated about $1\frac{1}{2}$ miles
 40 north-north-westward of the entrance. A bank, with depths of less than 5 fathoms (9^m1) over it, extends about $1\frac{1}{2}$ cables southward and one cable south-westward from the southern end of La Certosa, on the eastern side of the entrance; the light-buoy, marking the edge of the shallow portion of this bank, is described on page 590.

45 **Canale di San Marco and Canale della Giudecca.—Piles.**—Canale di San Marco is entered from the southern end of Canale San Nicolo, page 588. Santa Elena, previously mentioned, is situated on the northern side of the entrance and the church of Santa Maria Elisabetta, half a mile south-south-eastward, on the southern side;
 50 two short channels lead towards the vicinity of the latter church.

The northern entrance of Canale di San Servolo, the north-eastern entrance of Canale Orfano, page 587, and the southern entrance of Canale Orfanello lie on the south-western side of Canale di San Marco about 7 cables west-north-westward of Santa Maria Elisabetta.

Charts 1483, 201, 1440, 2158a.

Chart 1442.

The public gardens of Venice are situated on the north-eastern side of the channel close north-westward of Santa Elena. Thence the following quays line the northern side as far as Piazza San Marco, about $6\frac{1}{2}$ cables west-north-westward: Riva dell'Impero, Banchina San Biagio, Banchina Forni and Riva degli Schiavoni. The northern entrance of Canale Orfanello is situated on the southern side of the channel, about 4 cables south-eastward of the campanile of San Marco, which stands near the middle of the Piazza. The outer edges of the bank forming the eastern side of Canale Orfanello are marked by 10 piles.

Punta della Salute, the southern entrance point of Canal Grande, which divides Venice into two parts, lies about 2 cables south-south-westward of San Marco campanile. Off this point Canale di San Marco leads into Canale della Giudecca. 15

Canale della Giudecca trends about $1\frac{1}{4}$ miles in a westerly direction, along the southern side of Venice, to Stazione Marittima; Riva delle Zattere is situated on the northern side from about 5 to 7 cables westward of Punta della Salute and quays extend along this side for a distance of $4\frac{1}{2}$ cables farther. 20

The suburb of La Giudecca, with Isola San Giorgio Maggiore close off its eastern end, lies on the southern side of this channel; quays extend along its whole length but are bordered by a narrow shallow bank.

Lights.—A light is exhibited, at an elevation of 18 feet (5^m5), from 25 a concrete framework structure, situated on the southern side of Canale di San Marco, about 3 cables north-westward of Santa Maria Elisabetta campanile (*Lat. $45^\circ 25' N.$, Long. $12^\circ 22' E.$*).

The northern entrances and the sides of the two channels leading towards the vicinity of Santa Maria Elisabetta church are marked by 30 lights.

A light is exhibited, from a framework structure, on the eastern side of the northern entrance to Canale di San Servolo.

A light is exhibited, from a framework structure, on the eastern side of the southern entrance to Canale di San Servolo, about half a mile 35 south-south-westward of Santa Maria Elisabetta campanile.

A light is exhibited, from a framework structure, on the western side of the northern entrance to Canale Orfanello, about 4 cables south-eastward of San Marco campanile.

Berths.—**Mooring buoys.**—There are a number of mooring buoys 40 in Canale di San Marco.

The berths off the public gardens and Punta della Salute are reserved for men-of-war.

Passenger steamers can secure alongside Riva dell'Impero, where there are depths of 32 feet (9^m8) alongside; Banchina San Biagio, 45 where there are depths of 30 feet (9^m1); and the south-eastern part of Banchina Forni, where there are depths of 20 feet (6^m1).

Small local craft secure to the piers extending from Riva degli Schiavoni.

Vessels can lie a short distance off the quays situated on the southern 50 side of Canale della Giudecca.

Vessels can secure alongside the wharf extending from the middle of Riva delle Zattere and the quays lining the northern side of the channel between that quay and Stazione Marittima.

Charts 1483, 201, 1440, 2158a.

Chart 1442.

Arsenal.—The Royal Arsenal is situated at the eastern end of the city of Venice, about three-quarters of a mile north-westward of the entrance to Canale dei Marani. The arsenal is entered through a
 5 channel 82 feet (25^m0) wide in its narrowest part, which is crossed by a swing-bridge constantly open. This channel opens into a quadrangular basin surrounded by quays, in which there are depths of about 20 feet (6^m1). This basin communicates by a channel, 66 feet (20^m1) wide, and crossed by a swing-bridge, with the old basin which
 10 formed part of the old arsenal of Venice. The old basin is long and narrow and is divided into two by means of a sliding pontoon; it communicates with Canale di San Marco by Rio del Arsenale, which is accessible to boats.

Some dry docks are situated on the western side of Canale dei Marani
 15 close northward of the Royal Arsenal (*Lat. 45° 26' N., Long. 12° 21' E.*).

Stazione Marittima.—This is the commercial port of Venice and is situated at the western end of the city. It is connected to the railway system and to the inland waterways.

This harbour consists of two moles projecting south-westward,
 20 parallel with the quay at the western end of the city; the eastern mole is separated from that quay by Canale Scomenzera, which accommodates river and coasting craft. A large basin is contained between the eastern mole and Molo Costanzo Ciano, the western mole, in which there was, in 1939, a least depth of 23 feet (7^m0), except close along its
 25 eastern side, where there were depths of 16 feet (4^m9), near the northern end, and 20 feet (6^m1), near the southern end, with greater depths between.

A shoal, with a depth of 4 fathoms (7^m3) over it, lies on the northern side of the approach to this basin, about half a cable off the head of
 30 the eastern mole.

Westward of Molo Costanza Ciano there is an area, about a cable wide, with a least depth of 19 feet (5^m8) close alongside the quay.

The area in Canale della Giudecca, south-westward of Stazione Marittima, is used for turning vessels.

35 A large number of vessels can be accommodated in Stazione Marittima; berths are assigned by the Harbour authorities. The wharves are furnished with storehouses, electric lighting and cranes; the largest crane having a lifting power of 30 tons.

Regulations.—Sea-going steam vessels must proceed at a moderate
 40 speed, not exceeding 6 knots, and when near other vessels moored in the channel, speed is to be reduced to the slowest possible to keep the vessel under control.

Steam vessels entering or leaving should proceed at intervals of not less than 10 minutes.

45 Steam vessels of more than 1,500 tons net, when leaving Stazione Marittima in ballast, with a favourable stream or strong wind, should have a tug ahead to assist the steering until beyond the mooring-buoys off the public gardens. A tug will be compulsory for those vessels which have inflammables or explosives on board, when required
 50 by the Captain of the Port.

Steam vessels are not allowed to pass one another in the channel.

Any warping lines used must not obstruct navigation. The mooring posts in the channels and along the banks are fixed and assigned by the Port Harbour master. Mooring cables which present any danger

Charts 1483, 201, 1440, 2158a.

Chart 1442.

to vessels should be marked during the day by a noticeable mark, and at night by a *white* light.

A copy of these regulations, and also those affecting local steam and motor craft, will be shown to the masters of vessels by the pilots. 5

The regulations must be strictly carried out.

Chart 1483.

Porto Marghera.—Lights.—Porto Marghera, which was under construction in 1939, is situated from 2 to 3½ miles north-westward of Stazione Marittima. In parts of it, vessels, 492 feet (150^m0) long and 10 drawing not more than 28 feet (8^m5), can be accommodated.

This harbour is approached by Canale Vittorio Emanuele III, at the north-western end of which there is a basin communicating with several navigable canals. About halfway along Canale Vittorio Emanuele III, Canale delle Tresse trends about 2 miles in a west- 15 north-westerly direction to the southern end of Canale Industriale Ovest.

Canale Vittorio Emanuele III is marked by three pairs of lights, each light, at an elevation of 16 feet (4^m9), from a concrete framework structure; the three structures on the north-eastern side are black and 20 those on the south-western side are red.

Porto Marghera comprises Porto Commerciale and Porto Industriale.

Porto Commerciale consists of Bacino No. 1, which has a depth of 30 feet (9^m1) at the entrance and an average depth of 28 feet (8^m5) within. This basin is provided with a quay, known as Molo A, which is 25 3,281 feet (1000^m0) long; the basin terminates, at its north-western end, in a quayed area in which there are depths of 26 feet (7^m9).

Porto Industriale consists of:

(a) Porticciolo dei Petroli, which is entered from the north-eastern side of Canale Vittorio Emanuele III, about half a mile south-eastward 30 of its north-western end, and in which there are depths of from 27 to 30 feet (8^m2 to 9^m1).

(b) A basin, known as Darsena Raffineria, 590 feet (179^m8) long, with a depth of about 28 feet (8^m5), which can accommodate two 35 medium sized vessels at its quays.

(c) Canale Brentella, which trends about 6 cables northward from the north-western end of Canale Vittorio Emanuele III and terminates in a basin, in which there are depths of 21 feet (6^m1).

(d) Canale Industriale Nord, which is a continuation, for a distance of about 1½ miles, of Canale Vittorio Emanuele III. The entrance to 40 Canale Industriale Nord is narrow. A short distance within the entrance there is a basin, in which there are depths of about 20 feet (6^m1), and another basin is situated at the north-western end of the canal where there are depths of 19 feet (5^m8).

Two lights are exhibited one on each side of the entrance to Canale 45 Industriale Nord, each at an elevation of 26 feet (7^m8), from an iron framework structure, 20 feet (6^m1) in height.

(e) Canale Industriale Ovest, previously mentioned, which is about a mile long; the northern end being close westward of the north-western end of Canale Industriale Nord (*Lat.* 45° 28' N., *Long.* 12° 50 14' E.). The quays in Canale Industriale Ovest are available for vessels of small tonnage.

When completed, Porto Marghera will have four basins.

Regulations.—All craft, with a depth of less than 12 feet (3^m7),

Charts 201, 1440, 2158a.

Chart 1483.

crossing from Canale Vittorio Emanuele III and bound for Canale Industriale Ovest or other internal waterways, must pass through Canale delle Tresse so as to avoid the southern part of Porto Marghera.

- 5 This regulation also applies to such vessels proceeding in the opposite direction.

Chart 1442.

VENICE.—The city of Venice, called Venezia by Italians, which contained 171,000 inhabitants, in 1939, stands on an archipelago of
10 122 islets, connected by 400 bridges and intersected by 176 canals. It is situated near the middle of a lagoon which extends from Porto di Brondolo to within 3 miles of Fiume Piave (chart 201), about 30 miles north-eastward.

The city is divided into two parts by Canal Grande, the course of
15 which is north-westerly and south-easterly, in the form of the letter S, and which is crossed by three bridges. Venice is connected to the mainland, north-westward, by a bridge about 2 miles long, which carries the railway.

Steamboats maintain a frequent service between the public gardens,
20 at the south-eastern end of the city, and the north-western end of Canal Grande, calling at various intermediate points. The small canals serve as streets on which a large number of gondoliers gain their livelihood.

The cathedral of San Marco (*Lat. 45° 26' N., Long. 12° 20' E.*), standing in Piazza San Marco, page 593, is one of the finest in Europe;
25 its campanile is a distinguishing mark for vessels making the port.

The principal industries are the manufacture of glassware, carved furniture, lace, mosaics, porcelain, goldsmiths' work and articles of wrought iron, all of which are exported.

The principal imports are coal, cereals, combustible liquids, phosphates and timber.
30

Fishing is active in the channels of the lagoon and at a short distance from the coast.

British Consular Officers reside in the city.

There is a civil hospital with 1,500 beds, to which foreign seamen can
35 be admitted by Consular request; also a small Royal Naval hospital.

In 1937, 5,270 vessels, aggregating 5,232,000 tons entered this port.

Quarantine.—Deratisation.—The quarantine station is at Poveglia, page 583.

Deratisation can be carried out, *see* page 50.

40 **Communications.**—Venice is connected to the general railway system, the station being at the north-western end of the city. There is inland communication by lagoon steamers with Chioggia, at the south-western end, and Iesolo, at the north-eastern end of the lagoon, and other places in between.

45 There is regular steamer communication with ports in the Adriatic and Mediterranean, and other parts of the world.

Venice is in air communication with most of the important towns in Italy, and with a number of towns in Europe, including Paris and London.

50 There is a radio station, *see* page 46.

Port facilities.—There are three Government graving docks, for details of the largest, *see* Appendix I, page 602.

Patent slips are available for vessels of from 30 to 400 tons.

Charts 1483, 201, 1440, 2158a.

Chart 1442.

The quays are equipped with cranes of from 1½ to 3 tons capacity ; there are, in addition, one 6-ton, one 20-ton and one 30-ton crane.

Repairs of all kinds to hull and machinery can be executed. Divers can be obtained. Tugs are available, several equipped with pumps and salvage appliances.

Electric power is laid on to the quays of Canale della Giudecca, Stazione Marittima and Porto Marghera.

Fuel and supplies.—Large quantities of coal are kept in stock which can be supplied alongside, by ships' gear and hand baskets, at from 80 to 90 tons per hour, or from lighters at 60 tons per hour.

Large quantities of fuel oil are kept in stock which can be supplied alongside at from 80 to 1,500 tons per hour or from lighters at 300 tons per hour.

Fresh provisions are obtainable. Water is laid on to the quays or can be supplied in tank vessels.

Time signals.—A time signal is exhibited at noon, standard time, from the eastern turret on Isola San Giorgio Maggiore (*Lat. 45° 26' N., Long. 12° 21' E.*).

A similar signal is exhibited from the Sylos factory, situated near the head of the south-eastern mole at Stazione Marittima.

Weather and tides.—A bulletin is issued daily at 0800 and 1800 forecasting the weather, in the northern part of the Adriatic, and predicting the tides, in the vicinity of Venice, for the next 24 hours. This bulletin is exhibited at the base of San Marco campanile and copies can be obtained on request.

For meteorological tables, *see* page 33.

For Local winds, western shore of the Adriatic, *see* page 16.

Chart 201.

COAST.—From the entrance to Porto di Lido, the coast, which is low and sandy, trends about 54 miles east-north-eastward as far as Fiume Timavo, page 499. It is backed by large lagoons, the principal of which are the north-eastern part of the lagoon in which Venice is situated, mentioned on page 596 ; Laguna di Caorle, the principal entrance to which is Porto Falconera, about 20 miles east-north-eastward of Porto di Lido ; Laguna di Marano and Laguna di Grado, mentioned on page 487.

The network of inland waterways in and between these lagoons connects Venice with the lower reaches of Fiume Isonzo, page 495, and is connected with the sea by means of various ports.

Between the entrance to Porto di Lido and Porto di Piave Vecchia, 7 miles east-north-eastward, the coast, known as Litorale del Cavallino, consists of sandhills ; small boats have no difficulty in landing during fine weather. The pointed campanile of Burano, page 591, and the squat tower of Torcello, 8 cables northward, are conspicuous. *See* view of coast on chart 201.

Porto di Piave Vecchia.—**Light.**—Porto di Piave Vecchia lies at the mouth of Fiume Sile and is accessible to vessels, with local knowledge, drawing 6 feet (1^m8) ; within, the depths increase to 10 feet (3^m0). Fiume Sile, the course of which is tortuous, is in communication, by means of canals, with Venice, Treviso, about 18 miles north-westward of Porto di Piave Vecchia, and other places. Fiume Sile is connected with Fiume Piave by means of Canale Cavetta, the western

Charts 1440, 2158a.

Chart 201.

end of which is situated close to Iesolo, about 4 miles north-eastward of Porto di Piave Vecchia (*Lat. 45° 29' N., Long. 12° 35' E.*). Vessels can anchor in any part of the channel and secure to the shore against the freshets. The entrance may be identified by the light-structure.
 See view facing this page.

A light is exhibited, at an elevation of 40 feet (12^m2) from a white iron framework structure with a concrete base, 37 feet (11^m3) in height, on the western entrance point of Porto di Piave Vecchia.

- 10 **Porto di Cortellazzo.**—**Light.**—Porto di Cortellazzo, about 7½ miles east-north-eastward of Porto di Piave Vecchia, is situated at the mouth of Fiume Piave, which communicates with Caorle, 7½ miles farther east-north-eastward, and with the lagoons by various channels. Access to this port is obstructed by sandbanks on either side; in 1937, the channel was obstructed by an islet with a narrow channel at each end, that at the eastern end having a depth of about 4 feet (1^m5), and that at the western end, a depth of about 6 feet (1^m8). At high water, when the banks are covered and there is no trace of the channel, entrance is more difficult. It can only be entered by vessels with local knowledge.

Fiume Piave rises at the foot of Monte Paralba and is navigable by small craft to the village of Zenson, about 14 miles north-westward of its mouth. The river is subject to violent floods, during which the stream is rapid; its waters are white and milky and, at times, have the appearance of a beach off its mouth.

The position of Porto di Cortellazzo can be distinguished by its being nearly midway between the light-structure of Porto di Piave Vecchia and the campanile of Caorle.

A light is exhibited, at an elevation of 23 feet (7^m0), from a square concrete hut, 20 feet (6^m1) in height, on the northern bank of Fiume Piave, near its mouth.

Anchorage.—There is anchorage off Porto di Cortellazzo in a depth of about 8 fathoms (14^m6), mud and sand.

Vessels may anchor anywhere at a distance of about 2 miles offshore between Piave Vecchia and Caorle.

Coast.—The coast between Porto di Cortellazzo and Caorle, 7 miles east-north-eastward, consists of sandhills scarcely above the level of the sea. Under favourable circumstances it may be approached with caution by sounding, but in winter, south-easterly winds, which are of long duration, blow right on to it.

Porto Santa Margherita, about a mile west-south-westward of Caorle (*Lat. 45° 36' N., Long. 12° 53' E.*), is the mouth of Fiume Livenza, which is fed by the waters from the Friuli mountains and communicates with Venice, Treviso and other towns. The sandhill on the western side of the entrance is somewhat higher than that on the eastern, and when the mouth is well open, a group of houses is seen in the background in the midst of trees. The entrance, about a cable wide, with depths of less than 3 feet (0^m9), is over the flat which fronts the shore. The stream of the river and strong south-easterly winds occasionally alter the direction of the channel.

The small craft which visit this little harbour anchor offshore in depths of from one to 2 fathoms (1^m8 to 3^m7), mud.

The village of Caorle is situated on the seashore and its dark, pointed campanile, 162 feet (49^m9) high, is conspicuous. A stone embankment

Charts 1440, 2158a.

To face page 598.

*Cavalino
campanile.*



*Radiobeacon
destroyed
1945.*



*Lighthouse
replaced by
provisional structure
(1946).*

Isolo. Grisolera.



View in 2 parts of coast with Porto di Piave Vecchia, bearing 351°.
(Original dated 1939.)



*Caorle
Campanile
bearing 005°
distant 1½ miles.*

*Madonna
degli
Angeli.*

View of coast in the vicinity of Caorle.
(Original dated 1939.)

Chart 201.

protects the coast abreast the village, and on a projecting point north-eastward of it is the church of Madonna degli Angeli, the campanile of which is smaller and of similar form to that in Caorle, but the upper part is white. There is a railway station at Portogruaro, about 11 miles northward of Caorle. See view facing page 598.

Light.—Buoy.—A light is exhibited, at an elevation of 41 feet (12^m5), from a bracket on the campanile of the church of Madonna degli Angeli, close north-eastward of Caorle, see view facing page 598.

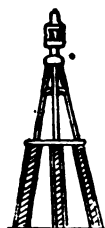
A buoy, surmounted by a cylinder, painted black, marks the outer end of a submerged mole extending $2\frac{1}{2}$ cables south-eastward from a point on the coast about $3\frac{1}{2}$ cables northward of Caorle light-structure. A vessel proceeding to Porto Falconera should pass southward and eastward of this buoy.

Porto Falconera.—Lights.—Porto Falconera is situated at the mouth of Fiume Lemene, about $1\frac{1}{2}$ miles north-eastward of Caorle. The harbour consists of the lowermost reach of the river and affords shelter from all winds for a number of small vessels. It is convenient for working cargo and the holding ground is good. The entrance channel, which is unmarked, is close eastward of Caorle and runs in a north-easterly direction. In 1939, there were depths of about 6 feet (1^m8) over the bar at the entrance, but at the entrance to the harbour, the depths increase rapidly to 4 fathoms (7^m3). The bed of the river is uneven and in places there are depths of 7 and 8 fathoms (12^m8 and 14^m6). To enter, local knowledge is necessary.

Fiume Lemene is not subject to floods; this river is in communication with Portogruaro, Venice and other places by inland waterways.

A light is exhibited, at an elevation of 20 feet (6^m1), from a white iron pile structure, with black stripes, situated on the eastern side of the entrance to Porto Falconera (*Lat.* 45° 37' N., *Long.* 12° 55' E.).

A light is exhibited, at an elevation of 20 feet (6^m1), from an iron column, on a white hut with red bands, 20 feet (6^m1) in height, situated on the western side of the entrance to Porto Falconera.



Porto Falconera light-structure on eastern side of entrance.



Porto Falconera light-structure on western side of entrance.

Coast. — Lights. — Between Porto Falconera and Porto Baseleghe, $3\frac{1}{2}$ miles eastward, the coast is low, sandy, and bordered by a shallow bank about three-quarters of a mile wide, parts of which dry. Vessels can anchor, in a depth of about 5 fathoms (9^m1), good holding ground, at a distance of $1\frac{1}{2}$ miles offshore, for temporary shelter from westerly gales or strong northerly or north-easterly winds; with onshore winds the anchorage is not recommended.

Porto Baseleghe, formed by the entrance to Canale dei Lovi, is situated in an inlet almost entirely obstructed by banks. It is only frequented by small craft, with local knowledge. The harbour can be identified by the red customs house, having a roof with two wind-vanes, on its eastern side, and by a dark red wooden hut on its western side.

A light is exhibited, at an elevation of 16 feet (4^m9), from a grey

Chart 201.

iron support, 22 feet (6^m7) in height, on the customs house on the eastern side of the entrance to Porto Baseleghe (*Lat. 45° 38' N., Long. 13° 00' E.*).

- 5 The coast between Porto Baseleghe and Punta del Tagliamento, 4½ miles eastward, known as Pineta di Rivellino, consists of low sand-hills and at its eastern end trends northward.

For the description of the light-tower on Punta del Tagliamento and the coast farther eastward, *see* page 493.

Charts 1440, 2158a.

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS, with details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, &c.	Length from Bilge of Caisson or Mitre Post of Gates at		Maximum Length of Keel Blocks	Breadth of Entrance at		‡ Distance { below (+) above (—) Chart Datum level of			Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.			REMARKS	
	Coping Head	Floor Head		Coping	MHWS Level	Sill	Blocks at			Maximum Depth over Blocks	Lifting Power			
			(1)*				(2)*	(4)†	(5)†			Entrance	Head	Forward
		Feet	Feet	(3)	Feet	Feet	(6)	(7)	(8)	(9)	Feet	(10)	(11)	(12)
KOTOR, Tivat Dockyard : Floating dock No. 2	410.9	348.3	—	—	—	26.1	—	—	—	—	—	—	7,000	Maximum length of ship that can be taken, 410 feet.
SPLIT : Floating dock .	375.0	311.0	—	—	—	—	—	—	—	—	18	18	3,500	Built in Germany, 1917.
KRALJEVICA : Floating dock .	223.0	211.0	—	50	49	—	—	—	—	—	14	14	1,700	180-foot pontoon used in conjunction with floating dock.
Patent slip . .	—	—	—	—	—	—	—	—	—	—	—	—	500	
FUME : Floating dock .	309.4	—	—	—	—	—	—	—	—	—	22	22	4,550	
PORTO ROSEGA : Floating dock .	541	450	—	91	83	26	—	—	1.3	21	21	21	13,000	At Porto Rosega and Panzano, the Port of Montfalcone.

* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length. Column (2) = Length on Blocks or Cradle.

† In the case of Floating Docks, Column (4) = Breadth at Top. Column (5) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

List of Ports available for Under-water Repairs, with Details of Largest Dry or Floating Dock or Patent Slip at each Port—continued

NAME OF PORT AND TYPE OF DOCK, &c.	Length from Bilge of Caisson or Mitre Post of Gates at		Maxi- mum Length of Keel Blocks	Breadth of Entrance at		† Distance { below (+) above (—) Chart Datum level of		Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.			REMARKS
									Maximum Depth over Blocks		Lifting Power	
									Forward	Aft	(12)	
	(1)*	(2)*	(3)	(4)†	(5)†	Sill	Entrance	Head	(10)	(11)	Tons	(13)
	Feet	Feet	Feet	Feet	Feet	(6)	Feet	Feet	Feet	Feet		
MONFALCONE : Floating dock .	584.5	538.7	—	118.1	110.7	39.5	—	—	35.5	35.5	21,500	
TRIESTE : Graving dock .	456	450	—	73	71	21.2	19	19	—	—	—	Water sometimes rises 18 inches above depth stated. Only vessels up to 56 feet beam can be accommodated, owing to the shape of the dock.
BRINDISI : Floating dock .	365	—	—	—	65	—	20.6	20.6	—	—	4,800	
ANCONA : Government slipway .	213.0	100.0	—	—	—	—	MHWS Aft 10.0	—	—	—	500	
PORTO RUMINI : Patent slip .	—	137	—	—	—	—	—	—	—	—	—	
VENICE : Government graving dock	820.1	810.3	—	117.7	117.7	39.25	36.3	33.2	—	—	—	

* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length, Column (2) = Length on Blocks or Cradle.

† In the case of Floating Docks, Column (4) = Breadth at Top, Column (5) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

APPENDIX II

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS
OF DEPTHS, &c.

PORT	Depth below Chart datum level		Rise of Tide		Remarks
	In channel of approach	In anchorage	Spgs.	Nps.	
Patras road ...	Deep	12 to 16 fms.	Feet —	Feet —	
Harbour	6 fms.....	3 to 6½ fms. .	—	—	
Argostoli.....	Deep	7 to 13 fms. .	—	—	
Corfu road	Deep	10 to 16 fms.	—	—	
Kotor, Gulf of.	Deep	5 to 20 fms. .	1	½	
Gruž	Deep	4 to 12 fms. .	—	—	15 to 20 feet alongside quays.
Split road	Deep	22 to 27 fms.	—	—	
Harbour	6 fms.....	4 to 5 fms. .	—	—	9 to 24 feet alongside quays.
Šibenik	10 fms.....	10 to 18 fms.	2	—	
Sušak	Deep	8 to 14 fms. .	1	½	23 to 32 feet alongside quays.
Fiume road ...	Deep	20 to 24 fms.	1	½	
Harbour	Deep	6 to 21 fms. .	1	½	21 to 30 feet alongside quays.
Pola outer harbour.....	Deep	10 to 18 fms.	2½	1½	
Pola inner harbour.....	Deep	11 fms.....	3	1½	
Baia di Muggia	10 fms.....	8 to 10 fms. .	—	—	
Trieste road ..	10 fms.....	10 fms.....	2½	1½	
Harbour	8 fms.....	4 to 8 fms. .	—	—	
Brindisi avam- porto	10 fms.....	7 to 9 fms. .	1	½	
Outer harbour	5½ fms.....	5 to 5½ fms. .	1	½	
Inner harbour	5 fms.....	4½ to 5½ fms.	1	½	
Ancona	4½ fms.....	4 to 5 fms. in northern part	about 2	—	19 to 29 feet alongside quays.
Venice	29½ feet	24 to 30 feet.	2·9	1·7	16 to 23 feet alongside quays.

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS OF DEPTHS, &c.
(continued)

PORT	Depth below Chart datum level		Rise of Tide		Remarks
	In channel of approach	In anchorage	Spgs.	Nps.	
Venice :— Porto di Chioggia	3 fms.	3½ to 7½ fms.	2·9	1·7	
Porto Malamocco	32 feet	5 to 5½ fms. .	3·0	1·7	Least depth of 22 feet in passage to Venice.
Porto do Lido	26 feet	4½ to 7 fms. .	2·9	1·7	Passage to Venice for vessels up to 29 feet draught.
Porto Marghera	29 feet		3·0	1·7	About 28 feet alongside quays.

APPENDIX III

LIST OF SPOTS SUITABLE FOR MAGNETIC OBSERVATIONS

<i>No.</i>	<i>Place</i>	<i>Lat. Long.</i>	<i>Position</i>
1.	Navarínon (Navarin) bay	36° 56' 24" N. 21° 42' 57" E.	Midway between two small but conspicuous trees, 30 feet (9 ^m 1) apart, situated on the beach 325°, 1½ cables from the bridge over Xeriás river. Transits :— (1) Right-hand extremity of Marathonísi (not named on chart 211) open just to the left of Mount Áyios Ilías (Elias). (2) Right-hand extremity of large yellow house just open to the right of distant mountain. (3) Summit of cone-shaped mountain midway between two conspicuous houses on plain.
2.	Zante	37° 47' N. 20° 55' E.	On hill called Stróúza (not named on chart 1609), westward of Zante and near the southern end of large Greek cemetery. 86 feet (26 ^m 2) south-eastward of south-eastern corner of cemetery wall and 18 feet (5 ^m 5) west-north-westward of edge of cut through which road passes ; marked by tent-peg driven flush with ground. Bearings :— Cross on tower of Áyios Dhionísios church, called St. Theonísios church by Carnegie Institution, 045° 40'. Cross on tower of Ayía Theotókos Faneroméniis church called St. Theotokos Phoneomenis church by Carnegie Institution 058° 48'.
3.	Patras	38° 15' 15" N. 21° 44' 10" E.	On breakwater about 300 feet (91 ^m 4) from the northern end. Transit :— Light-staff on the northern mole in line with the right-hand window of a square yellow house. Distant peak bearing 211° 36' 50'.

<i>No.</i>	<i>Place</i>	<i>Lat. Long.</i>	<i>Position</i>
4. Patras		38° 15' N. 21° 46' E.	In field enclosed by olive hedge on northern, western and southern sides, eastward of Patras and south-eastward of brick and tile kiln. 18 feet (5 ^m 5) south-westward, 18 feet (5 ^m 5) south-eastward and 208.34 feet (63 ^m 5), respectively, from fourth, fifth and tenth trees in row along ditch. Marked by tent-peg driven flush with ground. Bearings :— Spire on lighthouse about 3½ cables, 271° 21'. Lightning rod on smoke stack of brewery, about 11 cables, 350° 15'. <i>Note.</i> —As this position might be difficult to locate, position No. 3 seems preferable.
5. Kifisiá		38° 05' N. 23° 51' E.	Eastward of Kifisiá, called Kephisia by Carnegie Institution, at a place called Kefalári, where the National Observatory of Athens has made magnetic observations, about 656.2 feet (200 ^m 0) southward of water works, 443 feet (135 ^m 0) eastward of stone culvert which spans ditch near corner of grove, and 44.3 feet (13 ^m 5) north-westward of more northerly of two small pines near road ; marked by marble slab about 2 by 4½ by 18½ inches, projecting about 1½ inches above ground and lettered C.I. 1911. Bearings :— Weather vane on red pyramidal cupola on brown stone house, 1,148.3 feet (350 ^m 0) 297° 05'. Smoke stack of water works 005° 22'. 150 feet (45 ^m 7) eastward of Cape Áyios Theodhóros (Theodoro) lighthouse Spot marked with stone with X cut on it.
6. Argostólion (Argostoli)		38° 11' 36" N. 20° 27' 45" E.	
7. Platiyiáli (Plateali) harbour		38° 28' 38" N. 21° 06' 54" E.	On the line of the western pier, and 327.5 feet (99 ^m 8) from the inner end. Nearest corner of pink-coloured house, 166.5 feet (50 ^m 7) westward. Conspicuous tree, 43 feet (13 ^m 1) eastward. Bearing :— Beacon on the summit of Prómonas (Vromóna) island, 216° 36' 18".

<i>No.</i>	<i>Place</i>	<i>Lat. Long.</i>	<i>Position</i>
8.	Corfu	39° 38' N. 19° 56' E.	At extreme western end of Vido (Vido) island on bluff overlooking harbour; 124·7 feet (38 ^m 0) eastward of more southerly of two knolls (northward of ruins of old battery); 55·8 feet (17 ^m 0) southward of granite ledge at eastern end of northern knoll, 44·3 feet (13 ^m 5) northward of large stone on edge of bluff, and 59·06 feet (18 ^m 0) and 64 feet (19 ^m 5) north-eastward and south-eastward respectively from southerly and northerly of four stones embedded in the mound which extends from bluff to northern knoll (on this knoll there is a stone with a triangle and letters WD cut in top); marked by a white marble post about 4 inches by 4 inches by 15½ inches set about 11½ inches in ground and lettered C.I. 1911. Bearings :— Cross on lighthouse on Citadel 152° 58'. Tower of Ayios Spiridhon church, called San Spiriton church by Carnegie Institution, in Corfu 166° 09'.

Positions Nos. 2, 4, 5 and 8 were occupied, in 1911, by observers of the Carnegie Institution, Department of Terrestrial Magnetism.

APPENDIX IV

ALTERNATIVE GREEK NAMES

CHAPTER II

<i>Page</i>	<i>Line</i>	<i>Official Greek Name and English Term</i>	<i>Alternative Name</i>
52	3	Tainaron, Cape	Matapás
52	4	Akrítas, Cape	Gállo
52	28	Likódhimon, Mount	Mathía
53	6	Pelopónnisos	Moréa
53	40	Káyio harbour	Pórtο Káyio
55	11	Kitriés, Cape and bay	Kitrials
56	42	Kalámai harbour and town	Kalamáta
57	24	Petrokáravo	Avgó
59	4	Messíni town	Nisí
60	11	Skhíza island	Karvéra
60	32	Sapiéntza island	Sakótsa
62	29	Palaiókastron	Korifásion. The fortress of Pílos or Navarínon
62	39	Pílos island	Chiklí Babá
63	4	Khélo islet	Marathón
64	42	Kiparissía, Gulf of	Arkadhía
64	52	Aigáleos, Mount	Psikhró
65	6	Alfíos river	Roufiá
67	36	Vasilikós, Cape	Kosóron
68	52	Killíni, Cape and port	Glaréntza
69	26	Skinári, Cape	Skhoináron
69	32	Yeráki, Cape	Yerákas
69	42	Kerí, Gulf of	Laganás
69	51	Marathón islet	Marathonísi
72	21	Vóidhi islet	Triánda Ennéa
74	40	Klókova, Mount	Kakí Skála
75	21	Píros river	Kamenítsa
77	35	Ríon, Cape	Kástro tou Moría
77	49	Koutsouláris, Mount	Koutsiláris
78	28	Dhióni, Peninsula	Dhióniso
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Lojena, Uvala ; Žutski kanal . .	339	Luigi Razza, Molo	528	Anchorage	341	Light	529	Lojické, Uvala	352	Luigi Rizzo, Diga	503	Lokrum	196	Fog signal	504	Lokvino, Uvala	349	Lights	504	Lone, Val di	471	Luigi Rizzo, Molo ; Ancona . .	560	Longa, Punta	424	Luka = Harbour		Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228														
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Lojické, Uvala	352	Luigi Rizzo, Diga	503	Lokrum	196	Fog signal	504	Lokvino, Uvala	349	Lights	504	Lone, Val di	471	Luigi Rizzo, Molo ; Ancona . .	560	Longa, Punta	424	Luka = Harbour		Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																						
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Lokvino, Uvala	349	Lights	504	Lone, Val di	471	Luigi Rizzo, Molo ; Ancona . .	560	Longa, Punta	424	Luka = Harbour		Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																														
Lone, Val di	471	Luigi Rizzo, Molo ; Ancona . .	560	Longa, Punta	424	Luka = Harbour		Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																		
Longa, Punta	424	Luka = Harbour		Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																						
Longó, Port	60	Luka, Brački kanal :		Longo, Porto	424	Mala cove	265	Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																										
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Longós, Port ; Paxoi	144	Velika cove	264	Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																		
Longós reef, <i>see</i> Paxoi	App. IV 145	Luka, Port ; Brguljski zaliv . .	376	Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																						
Loortha, <i>see</i> Lourda	100	Luka, Ravski kanal :		Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																										
Lopar village	407	Uvala	348	Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																														
Loparska, <i>see</i> Uvala Šipanska ;		anchorage	349	Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																		
Otok Rab	406	Village	348	Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																						
Lopata, Rt ; Dugi otok	361	Luka, Rt ; Iški kanal	346	Lopata, Rt ; Otok Premuda . . .	380	Luka, Uvala ; Kaštelanski zaliv .	285	Lopud	204	Luka, Uvala ; Korčula	229	Anchorage	204	Anchorage	232	Village	205	Luka, Uvala ; Poluotok Pelješac .	233	Lopudska Vrata	204	Anchorage	233	Anchorage	205	Luka, Uvala ; Vrgada	314	Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																										
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Light	204	Lukavci, Hridi	244	Telegraph cable	205	Luke point, Otok Brač	264	Lopudski zaliv	205	Lukoran :		Anchorage	205	Mali village	325	Loreto	557	Veliki, Uvala	325	Loúbista, Mount	83	Village	325	Lourda (Loortha) bay	100	light	328	Louros river	135	Lukovac, Hrid ; Uvala Crnka . .	412	Loutráki, Gulf of Amvrakia : . .		Lukovac, Otočić ; Uvala Mag . .	411	Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																																																						
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Bay	138	Lukovac islet ; Lastovski kanal .	223	Village	138	Lukovnik, Otočić	296	Loutráki village, Corinth bay . .	93	Lukovnjak, Otočić	291	Lovćen mountain	181	Lukovo point, <i>see</i> Malta	412	Lovi, Canale dei	599	Lukovo-Otočko	412	Lovich, Punta	439	Lukovo-Šugarje :		Loviće (Šćedro), Luka	245	Harbour	402	Light	245	Village	403	Lovište, Rt	193, 233	Lukvenjak, Otočić	290	Light	233	Lumbarda, Pličina	353	Lovka, Uvala	363	Lumbarda village	227	Lovo, Porto	433	Mole	227	Low rocks, <i>see</i> Khamiloi	119	light	229	Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																																																																																										
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Loza, Uvala	383	Lun, Rt	396	Light	384	Lunga (Duga), Otočić	354	Ložica, Uvala ; Rt Gradina . . .	290	Lunga, Isolotto	476	Lozica village, Gruž	199	Lunga, Punta	423	Luarez	174	Lunga, Valle	469	Lubenizze village	436	Lungo, Porto	434	Luccovaz (Pod Kopiste), Isolotto .	214	Lupac, Otočić	295	Lucica, Scogli	449	Luro, Monte	566	Lučica, Uvala ; Hvarski kanal . .	257	Luski, Otočić	346	Lučica, Uvala ; Lastovski kanal .	220	Lusmarinjak, Otočić	363	Lučica, Uvala ; Luka Solišćica . .	362	Lusnjak, Hrid ; <i>see</i> Šašica . . .	378	Lučina, Uvala ; Dugi otok . . .	337	Lussingrande :		Anchorage	338	Cove	391	Lučina, Uvala ; Otok Molat . . .	376	light	392	Light	375	Town	391	Lučina, Uvala ; Pašmanski kanal .	318	Lussino :		Lučiće, Uvala	260	Canale di	391	Lučnjak :		general remarks	391	Otočić	228																																																																																																																																																																																														
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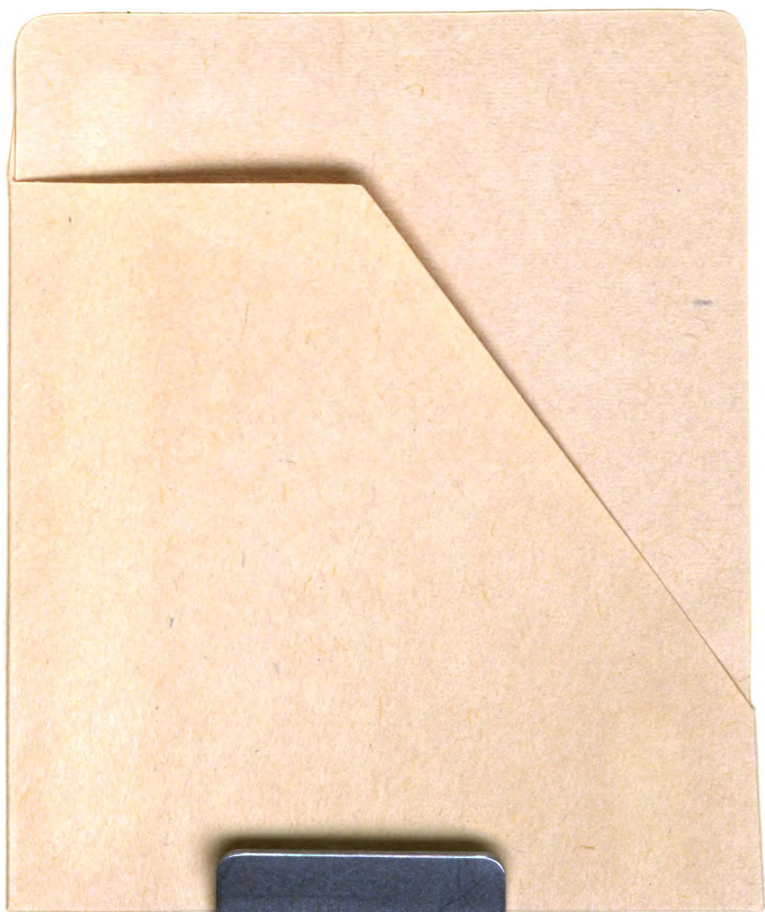
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